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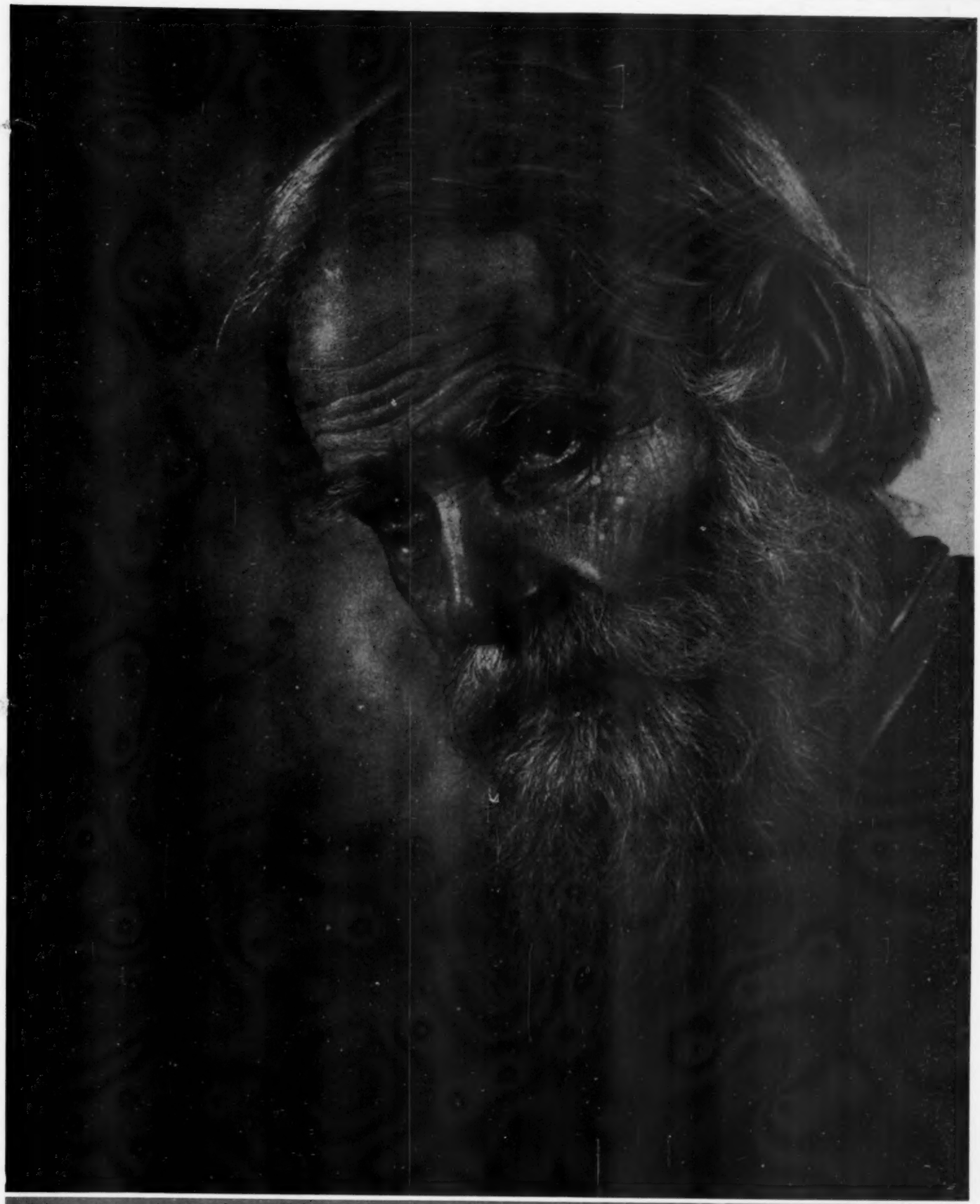

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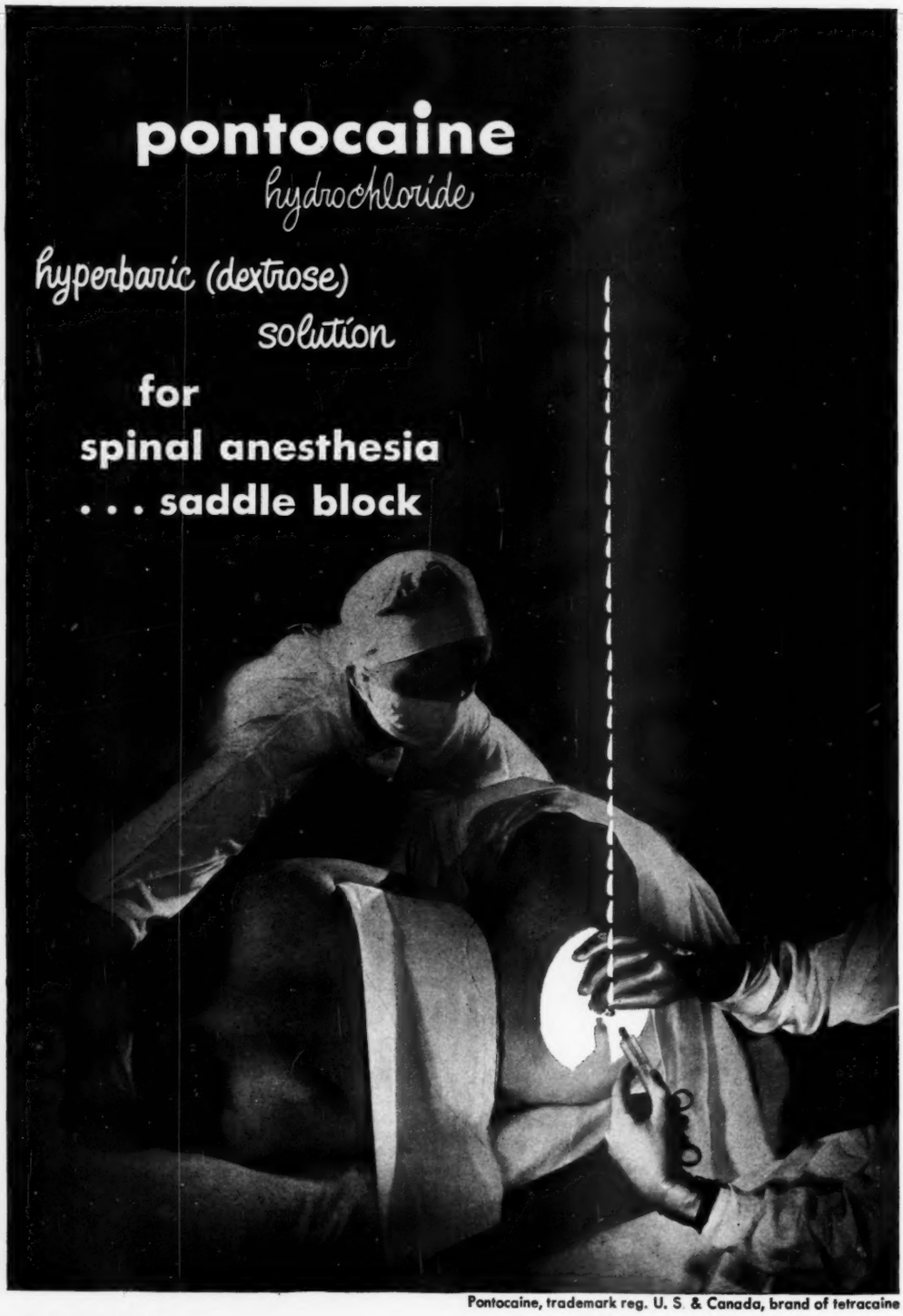

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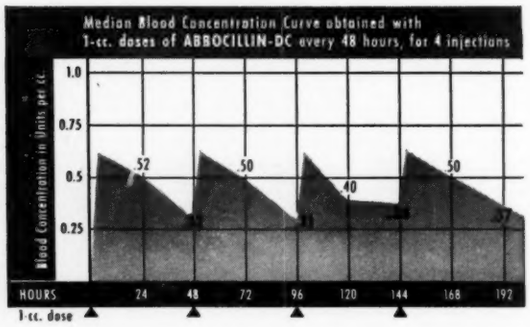

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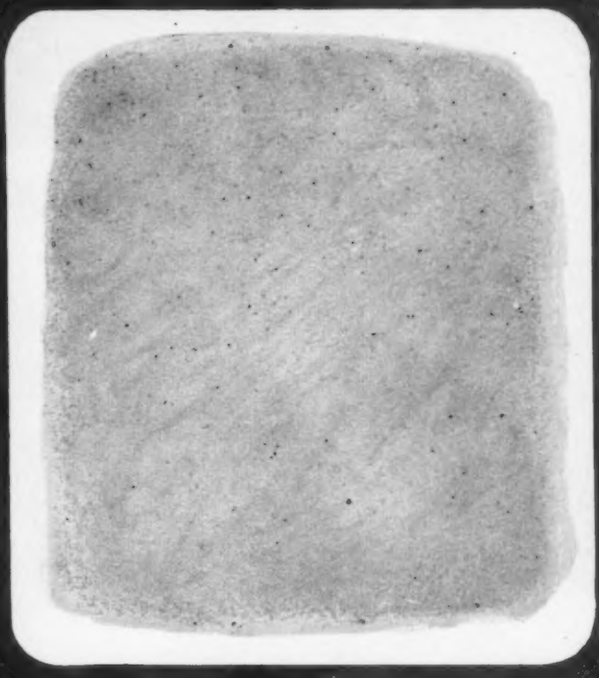

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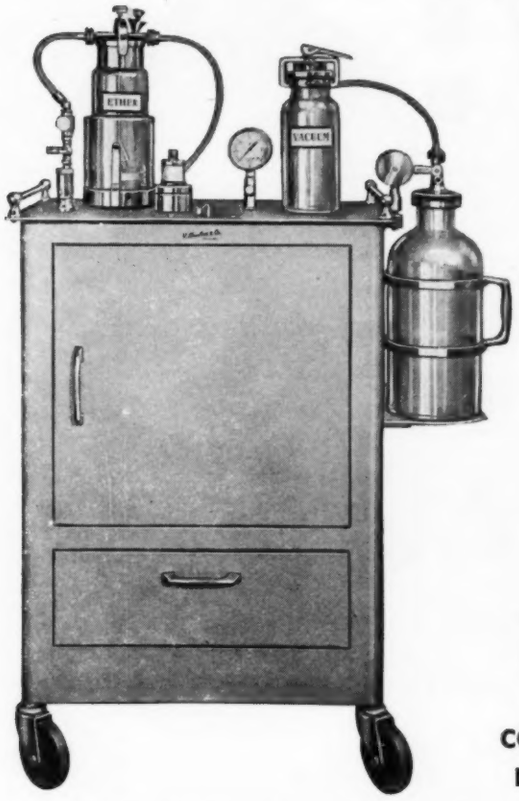

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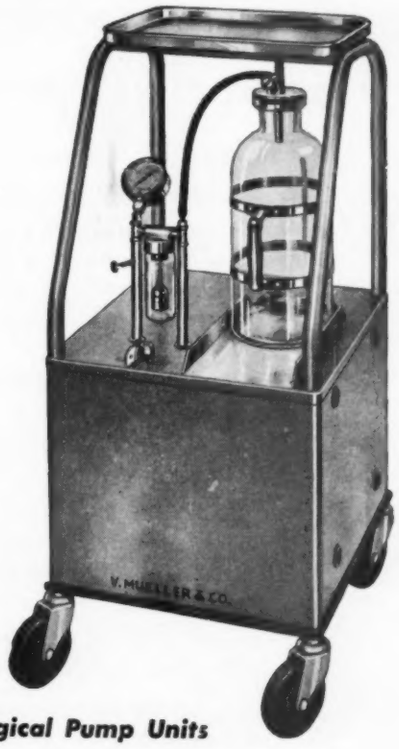

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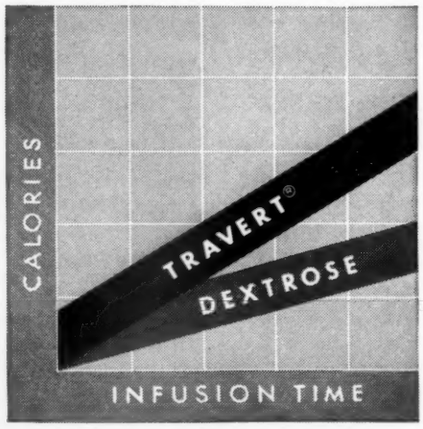

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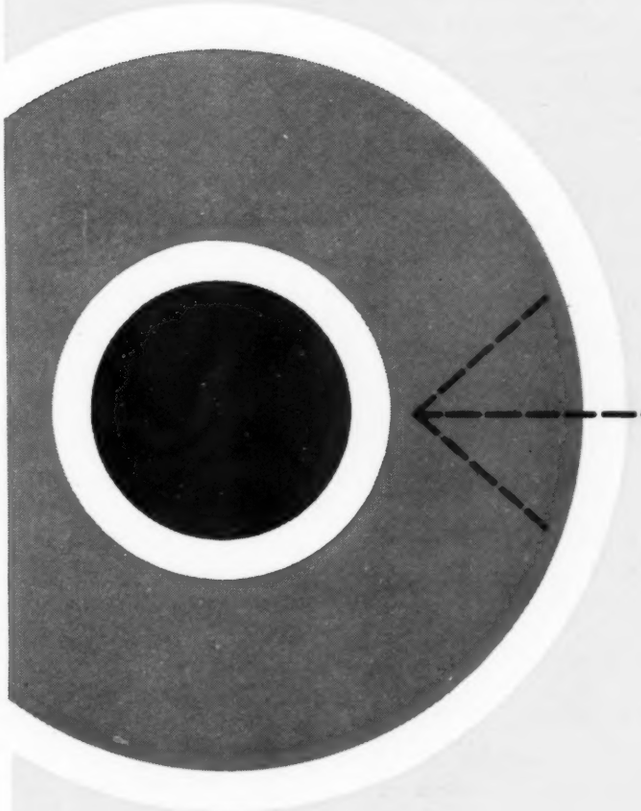

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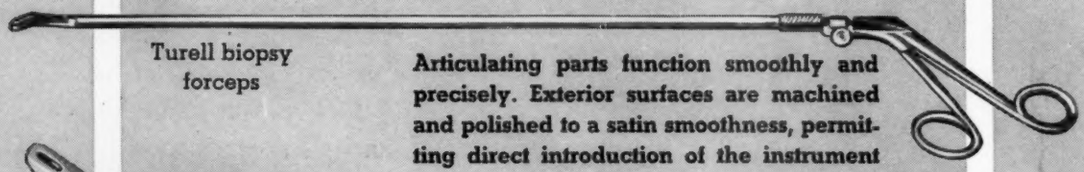

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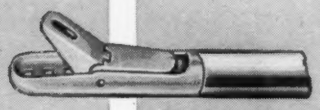

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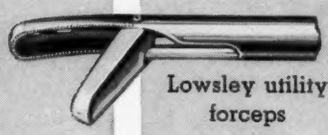

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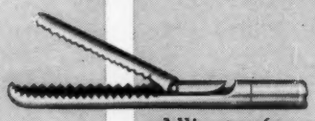

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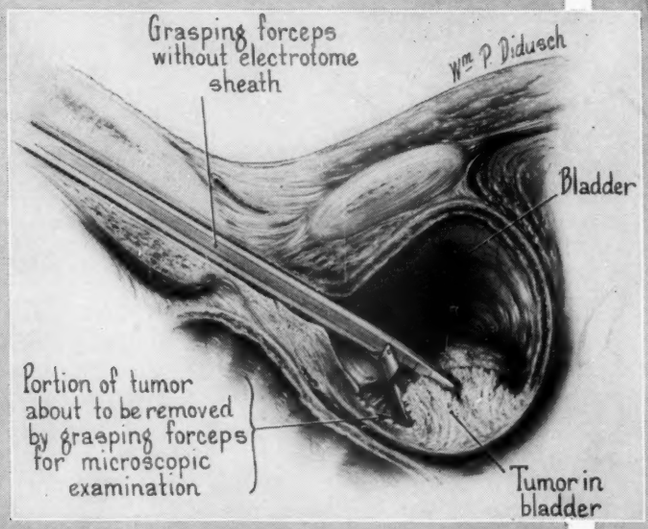
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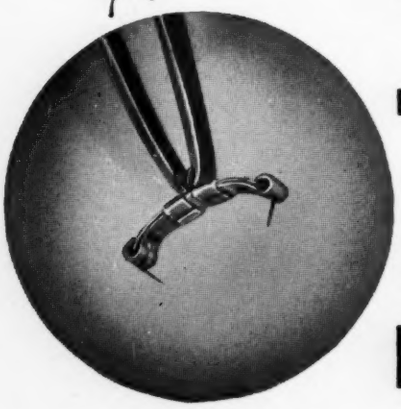

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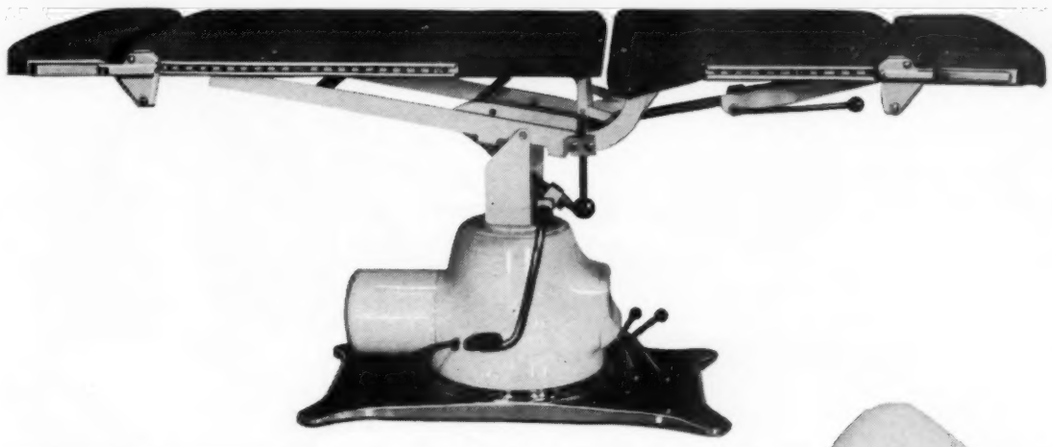

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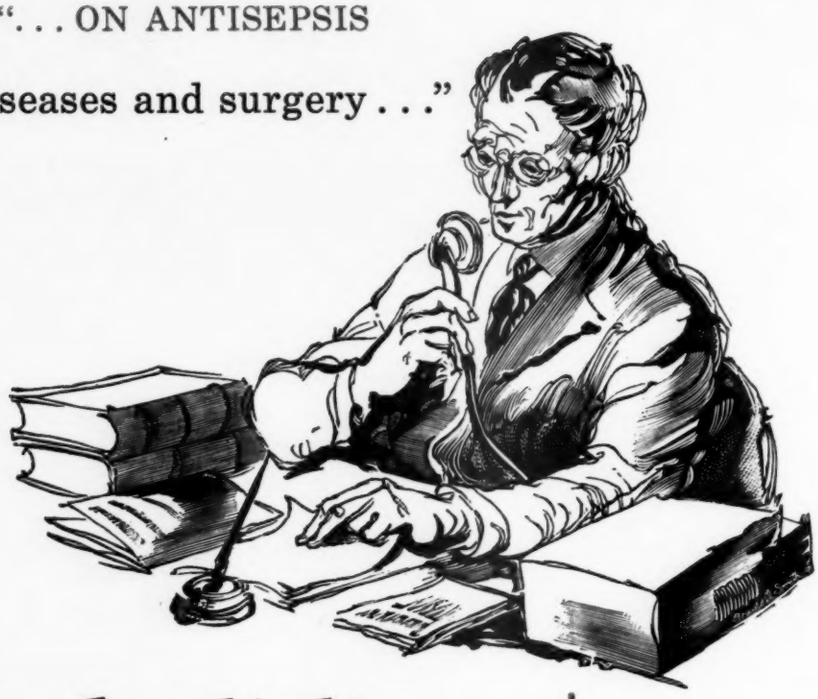

Sulfathalidine®

phthalylsulfathiazole

SHARP & DOHME

"... I quote from Streicher, who commented that SULFATHALIDINE® phthalylsulfathiazole 'is less toxic and more bacteriostatic than any intestinal agent used previously.' (J.A.M.A. 129:1080, 1945). In addition Portis concluded that in idiopathic, ulcerative colitis 'sulfonamide drugs inhibit to some extent the bacteria which take their toll on the unprotected mucous lining of the affected portion of the colon. My personal choice among them is phthalylsulfathiazole, given in doses of 15 to 30 grains (1 to 2 Gm.) three times a day.' (J.A.M.A. 139:208, Jan. 22, 1949)."

Indeed, when SULFATHALIDINE was introduced in 1945 its exceptional value was recognized at once and it is still a drug of choice for ulcerative colitis, regional ileitis, and enteric surgery. *About 95 percent of this potent bacteriostat remains in the bowel, a fact that accounts for its small effective dose and negligible toxicity.* Supplied in 0.5-Gm. tablets, bottles 100, 500, 1,000.

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Extreme Kidney Position
WITHOUT A KIDNEY ELEVATOR

Low Kidney Position—*32 inch minimum height at crest of break.*

Low Reflex Abdominal position—*from Kidney Position with one hand-wheel!*

PLUS

unusually LOW Operating Field in ALL Table Positions

The S-1506 Hermann Major Operating Table combines surgical research and engineering skill to provide the following unique features never before available on a single Operating Table:

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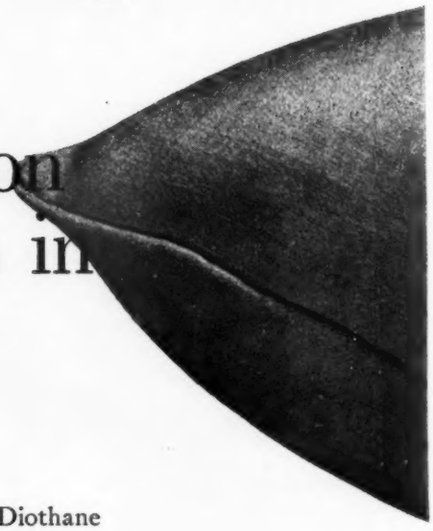

For hemorrhoidal patients, Diothane provides a long-lasting cushion against pain. A profound local anesthesia blends into a prolonged period of analgesia. Notably free from clinical toxicity, Diothane's mildly antiseptic action provides an extra safeguard against infection in the anorectal area. Write for further information and a clinical supply of Diothane.

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With oxyquinoline benzoate (Diothane 1%; oxyquinoline benzoate 0.1%)
Positive and prolonged comfort in hemorrhoids

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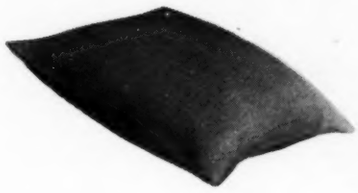
Where a non-greasy, water-soluble base is indicated
DIOTHANE HYDROCHLORIDE CREAM
(Diothane Hydrochloride 1%; Cetylpyridinium Chloride 0.1%)



Merrell invites you to see . . .

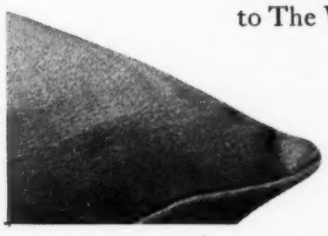
"An Improved Technic for the Operative Treatment of Common Anorectal Lesions"

Approved by The American College of Surgeons

a new surgical film in full color now available to the medical profession

The technic—perfected by **Louis E. Moon, M. D., F. A. C. S.,** President of the American Proctologic Society, and J. B. Christensen, M. D., F. A. C. S.* It offers a simple, practical, and successful method for proctologic examination and operative procedure in simple ligature extirpation of internal and external hemorrhoids, anal fissure, abscess, and simple fistula.

The film—runs approximately 45 minutes (16 mm., silent). Requests for showings should be addressed to The Wm. S. Merrell Company, Cincinnati 15, Ohio.



*Dr. Moon is Associate Professor of Surgery and Head of Department of Proctology—and Dr. Christensen is Assistant Professor of Surgery (Proctology) — at the Creighton University School of Medicine, Omaha, Nebraska.

SET NO.
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All-Purpose
RECTAL SET

A complete assortment of rectal instruments to meet the needs of thorough proctologic examination

This set includes the Welch Allyn *distally-illuminated* proctoscopes and sigmoidoscopes, providing abundant illumination, *without glare,* directly at the area under observation. An unobstructed view for diagnosis is assured. Obturator tips are tapered and curved for easy passage through the sphincter muscle and by the prostate gland region.

The new Welch Allyn anoscope, also a part of this set, features brilliant, shadow-free illumination, and an offset obturator handle ring which allows manipulation of the instrument with one hand, leaving the other free for treatment.

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Complete contents of this set are: No. 300 proctoscope and No. 304 infant proctoscope, No. 308 sigmoidoscope, No. 342 biopsy punch, No. 280 medium anoscope, one each rectal probe and hook, No. 700 battery handle, inflating bulb and No. 725 cord, all in attractive case.

Smaller Welch Allyn rectal sets are also available. Ask your surgical supply dealer or write us for complete rectal catalog.

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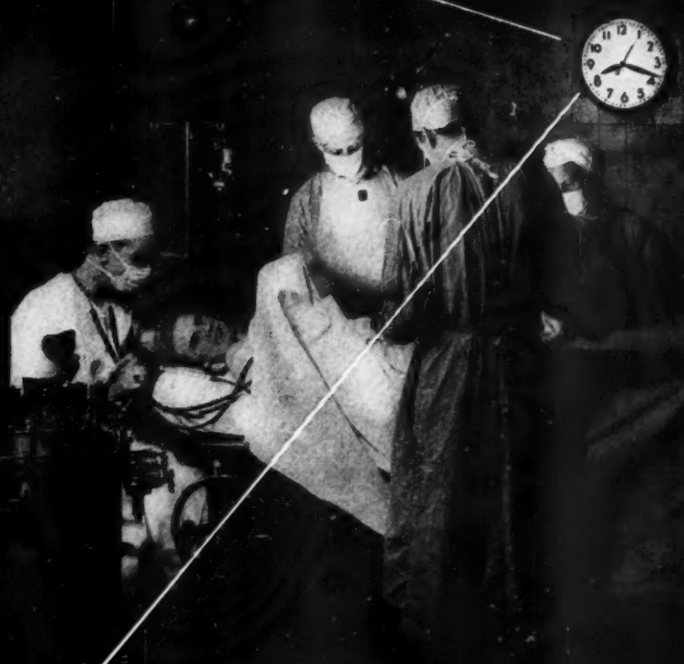

added safety for the patient
greater control for the surgeon

In its fast acting control of hemorrhage, KOAGAMIN affords a clearer field for surgery. It reduces bleeding in minutes, regardless of the cause, while Vitamin K, slower in action, is indicated only where prolonged prothrombin time is a factor. When used in conjunction with Vitamin K in such cases, KOAGAMIN effects more rapid control.

PREOPERATIVELY . . . . . minimizes oozing
POSTOPERATIVELY . . . . . controls secondary bleeding
THERAPEUTICALLY . . . aids control of internal bleeding

An aqueous solution of oxalic and malonic acids for parenteral use, KOAGAMIN works fast, at a time when speed, safety and control are needed.

Supplied in 10 cc. diaphragm-stoppered vials
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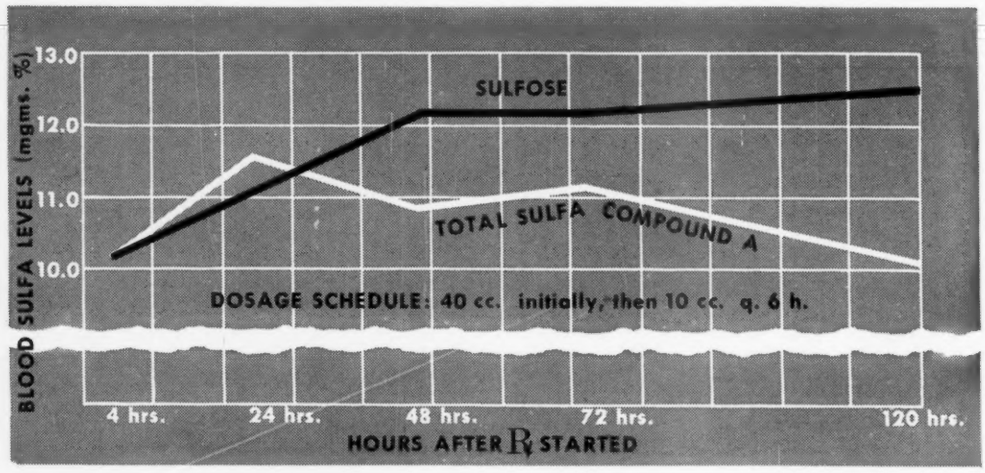

A comparison of blood sulfonamide levels on equal doses of SULFOSE and a control preparation having the same sulfonamide composition.

SULFOSE *contains sulfadiazine, sulfamerazine and sulfamethazine suspended in a unique, flavored vehicle containing a special alumina gel.*

- Unusually palatable
- Stabilized suspension—won't separate
- Easy to measure—pours freely

Each teaspoonful (5 cc.) contains 0.5 Gm. total sulfonamides—0.167 Gm. each of sulfadiazine, sulfamerazine and sulfamethazine.

SUPPLIED in bottles of 1 pint.

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TRIPLE SULFONAMIDE SUSPENSION

Wyeth®

WYETH Incorporated, Philadelphia, Pa.

a lung abscess
Resistant to other antimicrobial therapy
TREATED WITH TERRAMYCIN
W. F., male, age 33
History
Illness of 30 days' duration; temp. 102.4°; lung abscess, LLL; gram-pos. cocci, anaerobic strep.; fusiform bacilli in sputum cultures; chronic alcoholism; previous treatment with penicillin and sulfonamides with poor response.
Therapy
Terramycin, 3 Gm. daily for 21 days, orally in divided doses q. 6 h.
Result
Recovery. Response described as "good", with x-ray evidence of healing.
CRYSTALLINE
Terramycin
HYDROCHLORIDE
New Council-accepted broad-spectrum antibiotic
Orally effective—well tolerated
ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION
1. Terramycin may be highly effective even when other antibiotics fail.[1]
2. Terramycin may be well tolerated even when other antibiotics are not.[2]
Suggested for: acute pneumococcal infections, including lobar pneumonia, bacteremia; acute streptococcal infections, including erysipelas, septic sore throat, tonsillitis; acute staphylococcal infections; bacillary infections, including anthrax; urinary tract infections due to E. coli, A. aerogenes, Staphylococcus albus or aureus, and other Terramycin-sensitive organisms; acute brucellosis (abortus, melitensis, suis); hemophilus infections; acute gonococcal infections; lymphogranuloma venereum; granuloma inguinale; primary atypical pneumonia; typhus (murine, epidemic, scrub); rickettsialpox.
Dosage: 2 Gm. daily by mouth in divided doses q. 6 h. is suggested for acute infections.
Supplied: 250 mg. capsules, bottles of 16 and 100;
100 mg. capsules, bottles of 25 and 100;
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BRAND OF WATER-SOLUBLE CHLOROPHYLL DERIVATIVES

CHLOROPHYLL THERAPY FOR THE TOPICAL TREATMENT OF WOUNDS, ULCERS, BURNS AND DERMATOSES

Advantages of Chloresium

1. Promotes the growth of healthy granulation tissue.
2. Helps produce a clean, granulating wound base.
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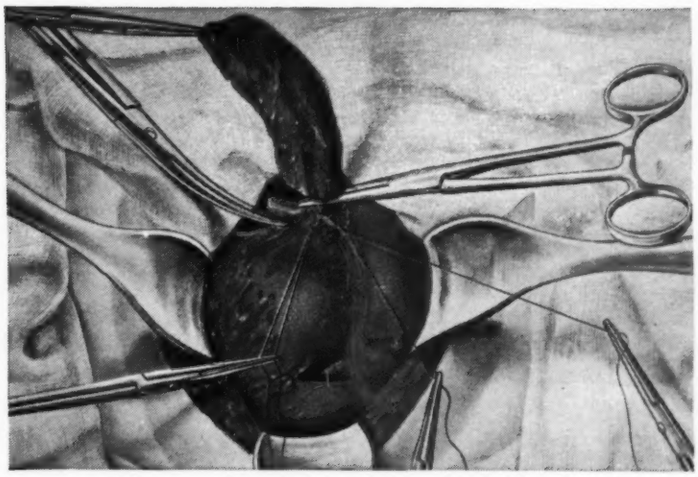
Solution (Plain)—2-oz. and 8-oz. bottles

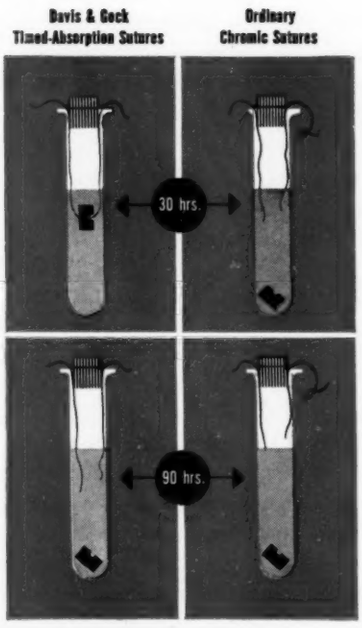
During the critical first 4 days depend on



"TIMED-ABSORPTION" CATGUT

Because "timed-absorption" catgut (surgical gut) has a *measurable* and *predictable* rate of digestion, demonstrated by extensive tests, it remains intact until the wound has gathered support of its own. Because "timed-absorption" catgut does not digest prematurely, it assures strength when needed most — during the critical first 4 days following major surgery.

Processed by an exclusive Davis & Geck method embodying accurately graded degrees of tanning, "timed-absorption" catgut has an absorption curve that parallels the changing tissue conditions of healing. Resistance to digestion is maximal during *early* repair. Later, when artificial strength is no longer required, dissolution is rapid and complete and no remnants of gut remain.



Comparison of D & G "timed-absorption" medium chromic catgut, size 0, with ordinary medium chromic size 0 catgut. Both types of catgut are suspended in a trypsin solution and weighted. Note that at the end of 30 hours D & G "timed-absorption" catgut remains intact; the weight is still held suspended up to 90 hours. Contrast with an ordinary chromic catgut suture which has begun to digest and breaks under the slight tension created by the weight at 30 hours. In human tissue all chromic sutures are digested *more slowly*, but the ratio between the two types remains the same.

D&G catgut sutures have a special matte finish. They tie readily and do not slip at the knot. Pliability is exceptional and tensile strength, diameter for diameter, is guaranteed unexcelled by any other brand. No wonder so many surgeons agree on D&G.

There is a D & G suture for every surgical purpose. Available through responsible dealers everywhere.

DAVIS & GECK, INC.

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Outside the Ivory Tower

PICTURED at the Waldorf-Astoria in New York City where they were present at the first in the series of "Tele-Clinics," the motion picture reports on medical meetings of national and international significance to the medical profession being produced by the Philadelphia pharmaceutical firm, Wyeth Incorporated, are left to right: Dr. Elmer L. Henderson, president of the American Medical Association and the World Medical Association; H. W. Blades, Executive Vice President of Wyeth, and Dr. Albert F. R. Andersen, clinical professor of Medicine of the State University of New York.

The Tele-Clinic they saw, featured highlights of the Fourth General Assembly of the World Medical Association which convened in New York in October.

Harry S. Howard, president of Wyeth, explained: "Medical people who are unable to attend the many important professional meetings throughout the nation now will be able to avail themselves of major medical developments through Tele-Clinic which will be of immediate use in the profession." Fifty prints of the first issue of "Tele-Clinic" will be made available to medical societies, hospitals, nurses groups, and other medical organizations by the pharmaceutical concern as a service to the profession. It is estimated that over 300,000 medical people in the country will have access to a showing of the film.

One of the highlights of the film is the adoption of the new medical oath, The Declaration of Geneva, by delegates to the Assembly representing more than a half million physicians. The Declaration embodies a new code of ethics for the profession presented at the London Assembly in 1949. Dr. Louis H. Bauer, secretary-general of the association, presents the Declaration of Geneva for "Tele-Clinic."

In the near future, French and Spanish editions of the film will be issued for international distribution. A schedule of films to be produced during 1951 is now being prepared. It is planned to film many of the major medical meetings in cooperation with the various medical societies and to distribute these films periodically.

THE Squibb Abstract Bulletin is now available to individuals and institutions on a subscription basis at $25 a year it has been announced by Dr. Geoffrey Rake, Director of The Squibb Institute for Medical Research and Medical Director of E. R. Squibb & Sons. The Bulletin now in its twenty-third year of publication is issued weekly. Abstracts of articles from approximately 500 American and European journals in the fields of medicine, pharmacology, chemistry and biochemistry are included. Each weekly issue contains nearly 100 abstracts. Abstracting is unusually prompt; the bulk of the material appears in the Bulletin within three weeks after receipt of the journals in the Squibb library.

THE use of electronic calculating machines in detecting early signs of cancer was described by Dr. Gilbert W. King of Arthur D. Little, Inc., a Cambridge, Massachusetts, chemical engineering firm, at a recent Seminar on Industrial Computation held at Endicott, New York, and sponsored by the International Business Machines Corp. Dr. King told how standard punched card computers can identify abnormal substances in urine specimens from suspected patients and how this may be significant in spotting cancer in its early stages. Many doctors believe that cancer causes rare hormone-like compounds and other chemicals to appear in the urine. However, the problem of finding these cancer "telltales" calls for lengthy and tedious analysis. When a urine sample is exposed to infra-red light or heat waves, some of the invisible rays are absorbed and the rest

(continued on page 28)

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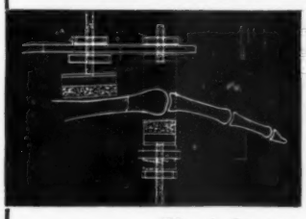

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GOLDBERG METACARPAL SPLINT. A closed method of treating all types of Metacarpal Fractures including the Thumb.

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For Parallax-Free Surgical Photography!

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35 mm Single Lens Reflex Camera

The Kine Exakta, with both regular and telephoto lenses, is widely used in hospitals for operation room photography. Its unique through-the-lens viewing system assures absolutely correct "on the subject" photographs during every step of the operation. In addition, this world famous medical camera is regularly used for preliminary, developmental, and end result pictures of patients; for copying X-Rays; and for making color transparencies of injuries and lesions —a necessity for recording and lecturing.

With f3.5 Zeiss Tessar "T" Coated Lens	$180.00*
Penta-Prism Eye Level Reflex Viewfinder	60.00*
Extension Tube Set	24.00
Microscope Adapter	29.50

* plus tax

Write Dept. 501 for free descriptive booklet "V" on camera and accessories and brochure on close-up technique with the Kine Exakta.

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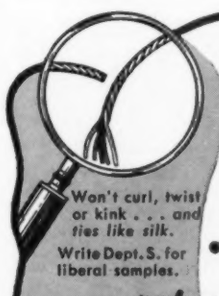

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the Multiple Strand Stainless Suture

Offers All These Advantages

- TIES LIKE SILK
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- MINIMIZES SUTURE INFECTION
- EASY TO STERILIZE

Won't curl, twist or kink . . . and ties like silk.

Write Dept. S. for liberal samples.

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SURGICAL SUPPLIES CO.
160 E. 56th Street, New York 22

Outside the Ivory Tower

(*continued from page 26*)

pass through. The result is an infra-red spectrum consisting of complex patterns of lines on sensitive photographic film. Each pattern is the fingerprint of an unknown substance in the urine and must be compared with other patterns obtained beforehand from previously analyzed chemical compounds. If two patterns match line for line the unknown substance has been identified successfully.

TREATMENT of tuberculosis, leprosy and undulant fever with antibiotic drugs has passed the speculative state and is definitely on the way toward practical solution," Professor Selman A. Waksman of Rutgers University, discoverer of streptomycin and neomycin, told the American Chemical Society's New York Section. "Moreover," Professor Waksman declared, "evidence obtained in the past few years strongly indicates that sooner or later antibiotics will be found which will combat virus diseases and tumors as effectively as known types control many bacterial infections. "Not since the days immediately following Louis Pasteur's proof of the relationship between bacteria and disease has a new branch of biology made such rapid progress as that achieved by antibiotic science," Professor Waksman said in a survey of "Present Horizons in the Field of Antibiotics."

WE should like to recommend several outstanding new books which have recently come across our desk. They are the following:

"Surgery of the Shoulder," by Anthony F. DePalma, M.D., is a beautifully made book consisting of 438 pages with 454 illustrations. It is well indexed and also has a bibliography at the end of each chapter. The J. B. Lippincott Company puts this book out for $17.50.

"A Syllabus of Laboratory Examinations in Clinical Diagnosis: Critical Evaluation of Laboratory Procedures in the Study of the Patient," edited by Thomas Hale Ham, M.D., has thirty-three contributors and sixty-six critics. References can be found at the end of each unit. It contains 496 pages with double columns, and the publishers have successfully attempted to keep the price of this book within everyone's reach. It should have a wide appeal. The price is $5.00 and the Harvard University Press is the publisher.

"The Closed Treatment of Common Fractures," by John Charnley, B.SC., M.B., is a small book with 190 pages and 133 figures. The Williams & Wilkins Company puts this book out for $7.00.

"Progress in Gynecology," Volume II, is edited by Joe V. Meigs, M.D. and Somers H. Sturgis, M.D., with seventy-eight contributors. There is also an insert of "Partial List of Commercial Preparations of Endocrine Products Used in Gynecology," by Patricia H. Benedict, which gynecologists will vote as AI. Its 821 pages are illustrated and indexed. The price is $7.50 and the Grune & Stratton Company is the publisher.

"Principles and Practice of Surgery," written by Jacob K. Berman, M.D., holds 1,378 pages with 429 illustrations and is indexed. The C. V. Mosby Company puts this book out for $15.00.

"Thoracic Surgery," by Richard H. Sweet, M.D., contains 155 illustrations and 345 pages, indexed. The Frontispiece was done in color by Jorge Rodriques Arroyo, M.D. This book is up-to-date in every particular.

A beautiful and scientifically solid book is the Henry Cushier Raven Memorial Volume, "The Anatomy of the Gorilla." The work deals with the studies of Henry Cushier Raven. There are contributions by such men as William B. Atkinson, Herbert Elftman, John Eric Hill, William L. Straus, Jr., Adolph H. Schultz and S. L. Washburn. It contains 259 pages, is beautifully illustrated and is indexed. This is a noteworthy work which is valuable to scientists in this field. The Columbia University Press of New York is the publisher, and the price is $15.00.

Why not give books to your housemen and professional colleagues for Christmas?

MORE than a million people, including 200,000 foreigners, patronize 120 health resorts centered around France's 1,700 mineral springs. President Vincent Auriol gave a reception at the Elysée for the heart specialists from five continents who visited the first World Congress of Cardiology in Paris.

THE Fifth American Congress on Obstetrics and Gynecology, sponsored by The American Committee on Maternal Welfare, Inc., will be held at Cincinnati, Ohio, from March 31 through April 4, 1952. The Netherlands Plaza Hotel will be the headquarters. The principal meetings and exhibits will be held there. The facilities of the other fine Cincinnati hotels will be utilized to as great extent as necessary to make this meeting worthy successor to the Fourth American Congress held in New York

(*continued on page 42*)

The Surgeon's Mart

When you are in need of surgical instruments or medical supplies you will find the dealers and manufacturers listed below ready to serve you. For your guidance when purchasing supplies we submit this list.

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Used in Leading Hospitals
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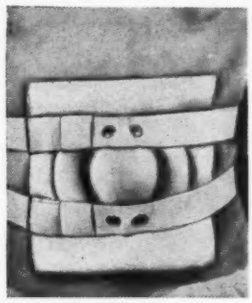
THE TRASK COLOSTOMY DOME, the only appliance that uses the 33 ply cellu-cotton disposable receiving pad. A new fresh pad after each movement keeps the patient immaculate at all times.



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If your dealer cannot supply your patients, order direct but be sure to mention your dealer's name.
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YOUNG'S DILATORS
Extremely useful in the treatment and prevention of contracted anus (particularly following hemorrhoidectomy), as an aid in perineal dissection, and repair following delivery.
Sold only on prescription—at your surgical dealer or ethical pharmacy.
Adult Set sizes 1, 1½, 2, 3—for stretching anal sphincter.
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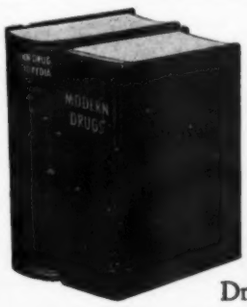

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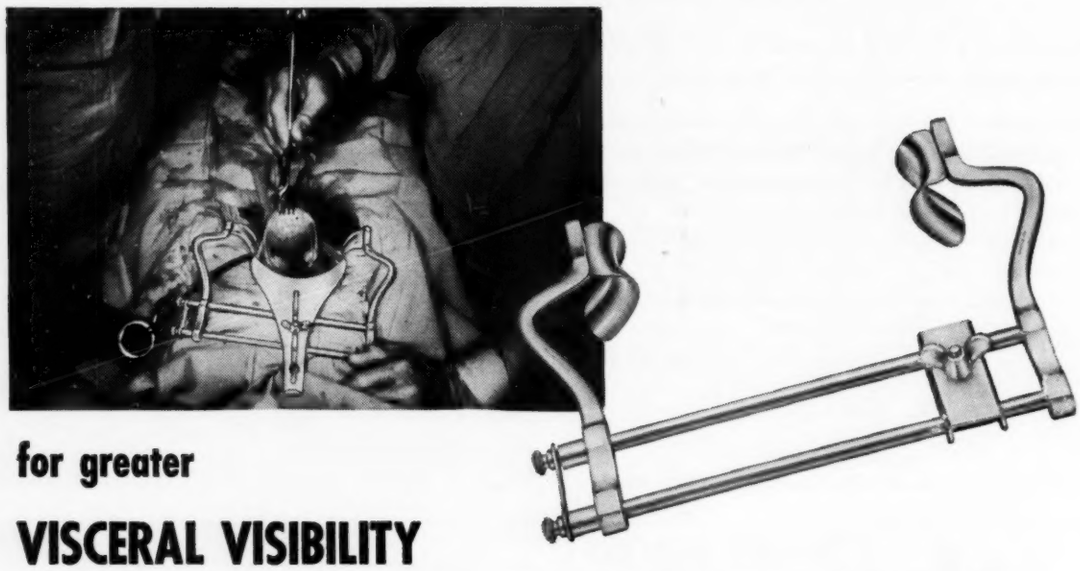

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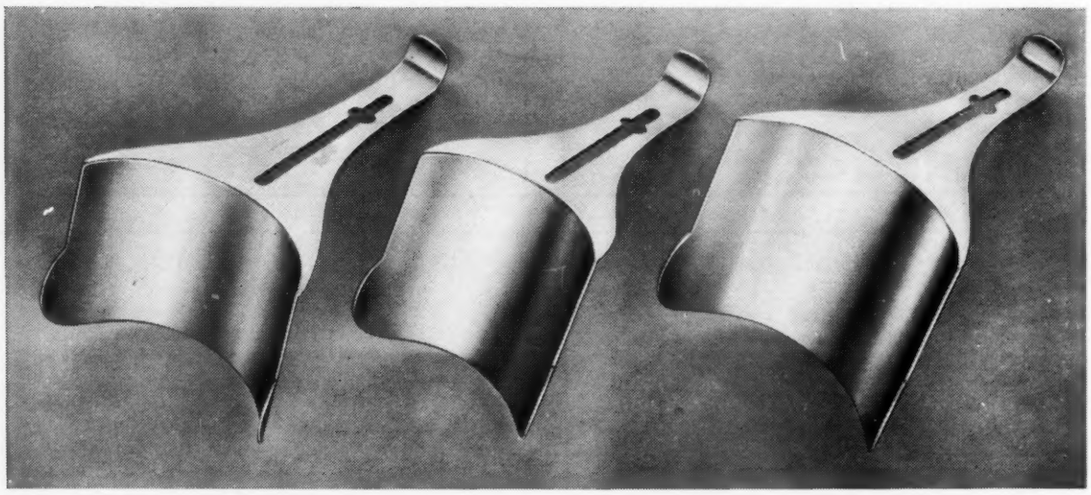

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Bibliography (1) Hewitt, W. L., and Williams, Jr., B.: New England J. Med. *242*:119, 1950. (2) Recinos, Jr., A.; Ross, S.; Olshaker, B., and Twible, E.: New England J. Med. *241*:733, 1949. (3) Wood, E. J.: Lancet 2:55, 1949.

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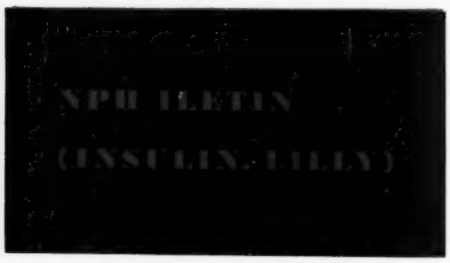

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Presidential Address

THE PAST, THE PRESENT AND THE FUTURE

LOUIS E. MOON, M.D.

Kansas City, Missouri

THE final duty of the retiring president is to present a report to the Society. I believe that the report should concern itself with matters pertaining to the present status, to the improvement and to the future of our Society.

In 1948 at the Columbus meeting a historical review was given of the organization of our society from its inception. In my review I will consider some of the many recommendations which have been made by past presidents. I have reviewed their addresses since 1909. I wish to comment upon what has been done in regard to the accomplishment of the things recommended. All recommendations pertain in a way to the acquiring of our present status.

About every third or fourth year the definition of proctology was discussed, and it was slow in being defined to the satisfaction of all. A full and complete definition of what we believe now constitutes proctology was not decided upon until the charter for the American Board of Proctology was obtained. In that charter proctology is defined as that branch of medical practice which deals with diseases of the colon, rectum and anus. At the present time this definition seems to be adequate.

Repeatedly, past Presidents have made recommendations in regard to the size of the membership of our Society, each time urging that it should be enlarged so that proctology could be disseminated more widely. Many believed that the membership of our society was too limited, that we should have a provision for admitting any ethical physician who is interested in proctology. Our Affiliate and Associate memberships have provided that opportunity to all who are interested in proctology. Fellow membership is for the physician who wishes to devote his entire time to proctology. Provisions for our membership at the present time are adequate. Our Society has had a healthy increase in its membership in this last year.

The lack of a suitable publication or a journal for our Society repeatedly appeared. The publication of the transactions of our Society began in book form in 1909 and continued until 1947. It was at that time that *The American Journal of Surgery* took over the publication of the papers which were presented at the meetings of the American Proctologic Society. During the years 1947 and 1948 there were no bound volumes, but the proceedings of the 1949 meeting have been published in book form. The recommendations in regard to a publication for our Society have now been carried out adequately. The arrangement with *The American Journal of Surgery* provides a means of publishing our deliberations which cannot at present be bettered. This publication arrangement will also facilitate the publication of our transactions in the future.

There has been a division among our mem-

bers during these years in regard to when and where we should meet. In the past the majority has been in favor of meeting at the same time and in the same city with the American Medical Association so that members of our Society might register and attend the meeting of the Section of Gastroenterology and Proctology. However, several meetings have been held separately and independently of the American Medical Association, and each meeting so held has been reported as having been well attended and a very successful meeting. It is my recommendation that the American Proctologic Society should hold meetings at a time when the American Medical Association is not in convention. If a meeting must be held in conjunction with the American Medical Association, it should be in a nearby city immediately preceding the American Medical Association. The membership of our Society is large and the importance of our meeting has become such that it should no longer be one of convenience; it should be a proctologic business meeting. The problems of our Society should receive your undivided thought and attention at this annual meeting. The meeting is a report of the work and thought that members have given to the Society during the preceding year. Our aim will never be accomplished unless the Fellows and Associates assume responsibility for the assignments given to them by the President. The affairs of our Society should be thought of other than at this meeting. It is a year-round job.

In 1912 it was suggested that we ask for a Section of Proctology in the American Medical Association. In 1913 a Section of Gastroenterology and Proctology was authorized. In 1916 Dwight Murray presented a resolution to the House of Delegates asking that a Section of Proctology be established. A Section of Stomatology then existed, and the House of Delegates agreed to include Gastroenterology and Proctology in this Section. It was called the Section of Stomatology, Gastroenterology and Proctology. In 1917 the name was changed to the Section of Gastroenterology and Proctology. However, it was 1947 before proctology was accorded full recognition as a specialty by the Committee on Medical Education and Hospitals of the American Medical Association. They then listed proctology as a specialty in all of their publications. Our relationship with the Council on Medical Education and Hospitals of the American Medical Association has always been excellent. Gastroenterology is a medical specialty. Proctology is a surgical specialty. Internists and proctologists do not belong in the same section. When proper teaching facilities have been established in more schools, we should ask that we be granted a Section of Proctology. In 1937 the Southern Medical Association authorized the establishment of a Section of Proctology, and this section has been well attended and its establishment justified.

In 1928 the high cost of medical care was mentioned, and it is still with us. With the increase of cost there has been an improvement in the care of the patient. The cost is high today, but the better care of the patient has justified an increase. In 1931 we were warned about the possibility of state medicine. In 1938 socialized medicine reared its head and our Society sent a resolution to the House of Delegates of the American Medical Association voicing its unanimous opposition to socialized medicine. Socialization plans are yet with us, but Blue Cross and Blue Shield and other voluntary insurance programs are demonstrating to the public that adequate medical care is available to all for a nominal fee, with free choice of physicians and without bureaucratic control. I believe that our Society should cooperate in every way possible with the American Medical Association in its constructive programs. We should join them in every possible way in combating the socialization of medicine, and we should participate in the National Education Campaign.

In 1916 the American College of Surgeons permitted the submission of proctologic case records in the fulfillment of requirements when applicants were asked to submit case records. In 1930 they recognized proctology as a specialty, and within the last year they have approved two hospitals as being suitable for proctologic residency training.

In 1932 the Philadelphia Proctologic Society was organized. This was the first regional society. In 1935 the New York Proctologic Society was organized, and since that time fourteen regional societies have been organized making a total of sixteen. These are located throughout all parts of the country, and each is an independent society and not a subsidiary of the American Proctologic Society.

Almost every year some part of the address

was spent regretting the fact that teaching facilities were not adequate. In 1920 C. F. Martin said, "Let us make this society the mouthpiece of authoritative American proctology in so far as it represents good usage." The next year he reported that proctology was being taught in the Graduate School of Medicine of the University of Pennsylvania as a two- and three-year course, a provision having been made for teaching proctology, and four special students had been enrolled. In 1929 Buie reported that the Mayo Foundation was permitting students to major in proctology for which they were to receive the degree of Master of Science. The course prescribed was for a three- or four-year period and Buie said, "I believe that if you can properly arrange for post graduate instruction, that the undergraduate instruction will take care of itself." He pointed out that the lack of progress in the past had always been due to the lack of teaching facilities. The University of Pennsylvania and the University of Minnesota were the first schools to present acceptable postgraduate teaching programs.

Surveys in regard to the facilities for teaching proctology in medical schools began in 1910. Dwight Murray made the first survey. Fifty-two questionnaires were sent out and thirty-two replies were received. Proctology was taught as a specialty in one school. It was included in general surgery in twenty-nine. It was taught by special instructors in ten schools. Hibschman made the second survey in 1934. Seventy-seven questionnaires were sent out and sixty-five replies were received. Proctology was taught as a specialty in twelve schools. It was included in general surgery in fifty-three. The number of special instructors was not given. Hamilton made the last survey in 1948. Eighty-two questionnaires were sent out and sixty-six replies were received. Proctology was taught as a specialty in thirty-five schools. It was included in general surgery in fifty-five, and instruction was given by a proctologist in thirty-eight schools. Proctology is combined with general surgery in the majority of medical schools. Instruction in proctology should be given in all medical schools. The department or subdivision of surgery under which it is taught should be headed by a proctologist, preferably one who has been certified.

To bring about improvement I would like to see our certified men, who are located in cities where there are medical schools in which proctology is not adequately taught, become associated with general surgery. It behooves us to work more closely with the surgical departments in all medical schools. We should align ourselves with the leaders in surgery and work with them. Many of them know our problems and are willing to assist us, and we in turn can be of service to them. Proctology is essentially a surgical specialty. Let us have a harmonious coalition with our surgery departments but ask that proctology be supervised and taught by a proctologist.

George H. Meeker, Dean of the Graduate School of Medicine of the University of Pennsylvania, in an address of welcome to our Society in 1931 suggested that our Society apply for an examining board of its own to certify to the proficiency of men desiring to practice proctology. In 1933 Rosser recommended that we apply for a Board, and in 1935 a charter was obtained. In 1939 a Board was permitted to organize and to function and was called the Central Certifying Committee. This Board was a subsidiary of the American Board of Surgery. In 1942 the first examinations by the Central Certifying Committee were given. The Committee functioned as a subsidiary of the American Board of Surgery until 1949 at which time proctology was granted an independent Board by the Advisory Board of Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association. Proctology attained full recognition when it was granted this Board which is known as the American Board of Proctology.

The Board has five functions. The first is to encourage the study, improve the teaching and elevate the standards of that science of medical practice which deals with diseases of the colon, rectum and anus, and which branch of practice is known as proctology. The recognition and approval of proctology as a specialty by the Advisory Board of Medical Specialties and the Council on Medical Education has done more toward the advancement, elevation and development of our specialty than any other one thing up to the present time. The task of improving the teaching and training facilities will fall to you who are certified. You are the ones who must lead the way and make an effort to have proctology recognized in your hospitals and in your medical schools. With

your help in the teaching and training programs the standards will be elevated.

The second function is to establish appropriate educational and training standards and to determine that candidates for certification receive adequate preparation. This is a function to be activated by the Board. Action has been taken by the Board toward defining what the educational training standards shall be. Each year the Council on Medical Education and Hospitals issues a booklet entitled "Essentials of Approved Residencies and Fellowships." In this will be found the requirements which have been prescribed by the Board.

The third function is to encourage the study, improve the practice and elevate the standards of proctology by assisting in perfecting the quality of graduate education. We are definitely in a period of changing times. What in the past was recognized as graduate training now no longer suffices. Collier F. Martin in his address in 1920 had this to say: "To teach students to be effective, surely requires more than six or twelve weeks." You will recall that graduate training was started in 1921 in the University of Pennsylvania, and in 1929 at the Mayo Foundation, and in 1946 the Council on Medical Education and Hospitals gave approval for establishing residencies in proctology in approved hospitals. We now have ten hospitals approved by this council which have provisions for conducting a residency training program. These ten residencies accommodate approximately eighteen men and they are located as follows: Allentown, Pennsylvania; Buffalo, New York; Chicago, Illinois; Detroit, Michigan; Milwaukee, Wisconsin; Pittsburgh, Pennsylvania; Reading, Pennsylvania; Rochester, Minnesota; Youngstown, Ohio; and two in Philadelphia, Pennsylvania. We should encourage all surgical residents whom we contact to qualify for proctology by spending the last two years in proctology. We are fortunate in having as many residencies as we do, but some of the most valuable teaching facilities in the larger cities have not been made available to us. Some of you in each of the large medical centers should volunteer to call the Fellows and Associates of our Society and any surgeon interested in proctology together to study the possibility of getting the cooperation of your hospitals and clinics and medical schools.

Extramural preceptors were suggested by C. F. Martin to assist in completing the training of students who had enrolled in the Graduate School of the University of Pennsylvania. In 1947 and 1949 the establishment of preceptorships was again suggested. Provisions should be made for finding preceptors for residents who have had a year of formal proctologic training and are desirous of having a second year of practical training. The job of determining who can be preceptors and of defining the duties of preceptors is yet to be completed.

Short postgraduate training courses are being given by seven different groups—two by medical schools and five by postgraduate divisions of medical schools. Credit toward certification cannot be given for attending these courses. There are many in the Society who have no desire to limit their work to proctology, but they are desirous of increasing their knowledge of the field. These men should attend postgraduate courses of the aforementioned type, visit proctologic clinics and attend proctologic meetings.

The fourth function is to determine the ability and fitness of candidates who seek certification by subjecting them to comprehensive examinations. This is a Board function but you can help. Those of you who apply for certification should come prepared so that it will be a pleasure for the Board to examine you rather than a regret. The examining function has been established and is in operation. The first examinations were held in Philadelphia, November 12, 1949, and two examinations have been held since then.

The fifth function is to award certificates of approval to those candidates who fulfill all requirements, and to prepare and maintain a registry of diplomates of the board which will be available to all who may be interested in its contents. This is a Board function.

The establishment of the Board brought many obligations to all members of this Society. The real responsibility rests upon the shoulders of you who have been certified. You are the members who must assume the responsibility. The American Board of Proctology is your representative. The Board has a job to do. It needs your help and depends upon you.

Our Society needs a permanent secretary. We are asking too much when we ask one of our members to conduct the secretarial duties

incident to a Society of this size. It is hoped that in the future some arrangement can be made whereby a full-time secretary can be employed by our Society, and that in the secretary's office it will be possible to carry on some of the duties of the secretary of the American Board of Proctology. A central office of that type would provide a repository for our records and a library for proctologic books and proctologic literature which could be used as a reference library by our members.

In 1949 Bacon said, "Our society is anxious to establish and to maintain a flow and exchange of ideas with professional colleagues from other parts of the world." This international relationship should be encouraged. We profited last year by the presence of our foreign guests. Our Society should extend invitations to the members of all proctologic sections and societies throughout the world for each of our meetings.

I would like to see the number of regional societies increased. More physicians each year are expressing an interest in proctology, and many are asking how they can enter proctology and where they can obtain instruction. Your regional society should provide teaching facilities for the general practitioners in your area. You should give lectures in proctology to interns and residents in hospitals which do not have proctologic sections. I would like to see a committee appointed by the regional societies to correlate the activities of their societies.

In 1920 Collier F. Martin had this to say: "Your president feels strongly that a true progress rests upon a basis of constructive criticism. At the present time our country is passing through a wave of reform, which unfortunately seems to trend toward deformity and disintegration. Everything that we formerly believed in is being investigated and reorganized, taxed and regulated. The resulting uncertainty in economic conditions is even being felt by the medical profession." According to that our problems or difficulties today are no different from those of thirty years ago. We do have some very serious problems for our Society to solve today. We are living in a troubled period of the world's history. Our responsibility as a Society has never been so great and the problems we face have never been more difficult.

Our biggest problem is still, How are we to provide adequate postgraduate and undergraduate teaching facilities for those desiring instruction in proctology? We cannot provide these facilities without your help.

Our duty at present is to do that which lies clearly at hand, but we must also have perspective and all plans should provide for the future expansion of our Society. We should be looking ahead and each established teaching unit should act as a research laboratory in planning for the future. You who head teaching positions and residencies should assist those who are trying to establish teaching units. You should work with the Education Committee since our Society should be a school in which the scholars teach each other. The opportunity is at hand for each of us.

Our past Board members never accepted failure as permanent and thus obtained a Board, so we now must not accept success as permanent. When contentment enters progress ceases, and defeat is for those who acknowledge it. A lot of hard work is yet to be done. Constructive ideas are such funny things; they never work unless you do.

Papers of the Scientific Sessions

BARIUM MODIFICATION WITH METHOCEL*

MARK M. MARKS, M.D.
Kansas City, Missouri

RECTAL impaction following the ingestion of barium sulfate for x-ray studies is a frequent and disconcerting problem confronting roentgenologist and proctologist alike. In trying to prevent this complication many substances have been added to the basic salt. Tannic acid, hypertonic salt solutions, vegetable gums of the hemicellulose variety and more recently fruit sugars and tetragalacturonic acid in the form of pectin have all been employed with varying degrees of effectiveness.

The difficulty arising from the oral administration of barium sulfate-water mixtures is that as a temporary suspension the fluid portion is rapidly absorbed in the major bowel leaving an insoluble salt to concentrate and solidify. Because of the poor miscibility of the compound with either mucus or the fecal stream the sulfate particles tend to form concretions. These, in flake form, are known to adhere to the gastric wall and other parts of the digestive tract and create odd patterns for x-ray interpretation. In diverticulas fluid barium is often entrapped and remains as a foreign body. Gastrointestinal studies in elderly people must be followed with saline purges to remove the barium because of the ever present danger of impaction or obstruction.

During the past two years extensive studies made on the physiologic effect of cellulose esters in the digestive tract proved them to be non-irritating, non-allergenic and completely miscible with the intestinal stream.[1–5] There is no interference with digestion or normal symbiosis of the intestinal flora. Physically it readily goes into solution with water and forms an adhesive, lubricating gel that is highly satisfactory in assuring the passage of examining instruments into the body orifices.

Microscopic examinations of barium-water mixtures show an immediate clumping of barium particles. The coalescence continues until a firm concretion forms with the evaporation of water. The methyl cellulose† suspension shows a constant dispersion of salt particles as long as any fluid remains. Brownian movement can be seen until dehydration forms a gel. From this the conclusion is that the addition of methyl cellulose creates an iso-electric form of barium.

Knowledge of its physical and physiologic properties led to the incorporation of methyl cellulose in powder form in barium sulfate; 2.5 per cent by weight of this material were sufficient to produce a deflocculation or permanent suspension when mixed with water. Taken by mouth there is no objectionable taste and x-ray opacity is satisfactory. Passage through the digestive tract is without delay and is complete in thirty-six to seventy-two hours. Purging is not required. Even after a three-day restriction in emptying time the barium passed as a soft curd without evidence of concretions and was well mixed with bowel content.

A demonstration of the adhesive properties of this mixture is in its use in double air contrast enemas. Five hundred grams of the dry mixture in 2 quarts of water are employed as a retention enema. Following expulsion air is injected to fill the bowel. Remarkable clarity of the detailed mucosal patterns is created by the colloidal suspension. (Fig. 1.) The dispersion of the opaque earth is so fine that third dimensional effects are obtained (Fig. 2) and variations from normal are more easily demonstrated.

† Manufactured by the Dow Chemical Co., Midland, Mich.

* From the Section on Proctology, Department of Surgery, Menorah Hospital, Kansas City, Mo. This paper received the Hermance Plaque for 1950.

FIG. 1. Demonstrating clarity of mucosal pattern in normal upper intestinal tract.
FIG. 2. Third dimensional effect in the large bowel.
FIG. 3. Barium enema with lightening-up effect.
FIG. 4. Air contrast study of same patient demonstrating a single polyp that produced lightening-up.

Since one of the biggest problems in x-ray diagnosis has been that of localizing polyps, several cases of this entity have been selected. Their detection was made relatively easy by the use of this mixture which is of such consistency that masking of the growth does not occur. A framing effect is created. (Fig. 3.) Complete evacuation followed with air instillation shows polyps thinly covered with the emulsion and sharply outlined. (Figs. 4 to 6.) This effect aids the observer in detecting the lesions under fluoroscopic visualization.

The same advantage pertains to neoplastic lesions. Figure 7 demonstrates the scalloping defect in the contrast material clearly indicating carcinomatous involvement. The translucency of the media permits earlier recognition of lesions hidden by loops of bowel commonly seen in the splenic flexure.

The value of this barium mixture in mucosal ulcerative colitis is particularly appreciated. An example is seen in Figure 8 in which the demarcation between affected and non-affected areas can be readily seen. The scarred and involved segments of the bowel are clearly demonstrated.

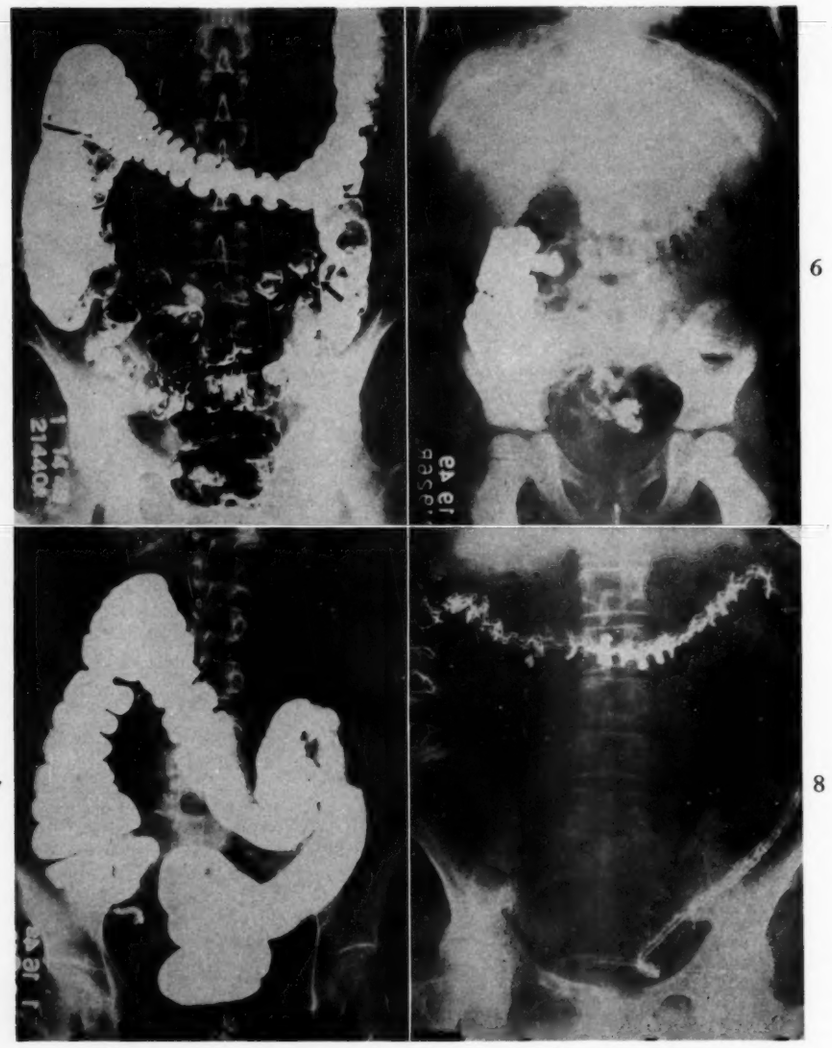

FIG. 5. Air contrast study of the bowel demonstrating the cobra sign of a polyp.
FIG. 6. Single polyp in a child.
FIG. 7. Barium enema showing defect in splenic flexure caused by carcinoma.
FIG. 8. Air contrast study of the bowel showing the scarred effect of chronic ulcerative colitis.

CONCLUSIONS

1. A permanent emulsion of barium sulfate can be made with the addition of 2.5 per cent methyl cellulose 400 C.P.S.
2. The mixture will not inspissate when ingested.
3. A finer detail of the normal and abnormal mucosal patterns is demonstrated.

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DISCUSSION

R. A. SCARBOROUGH (San Francisco, Calif.): I have been very much interested in Dr. Mark's paper, primarily because we are all interested in

the problem of detecting as early as possible any polypoid adenomatous lesion that may turn to cancer.

Fifteen years ago we were satisfied in barium enema examinations if we inserted barium into the rectum and found a level of obstruction in the colon; that told us where the cancer was. Today we are always disappointed if a patient gets to the point where diagnosis shows obstructing carcinoma; certainly we have a tremendous field of preventive medicine in finding the early precancerous lesions.

Various men in different parts of the country are using various technics. I do not think any of us have arrived at a solution. We have been trying one; Dr. Marks has another. We hope his is better than ours because although we think ours is good we are not satisfied with it. I think we all should keep working on this problem in order to diagnose these lesions earlier.

Louis A. Buie (Rochester, Minn.): I have been very much interested in the work of Dr. Marks. Frankly, I do not believe I am in a position to discuss this subject. If there is anything that can be done to facilitate the examination of lesions in the colon, all of us, of course, want to have it as part of our diagnostic armamentarium. I compliment Dr. Marks on his presentation.

Paul H. Deeb (Los Angeles, Calif.): I deeply appreciate the privilege of discussing this paper by Dr. Marks and his observations on the use of methocel. Dr. Marks' observations represent another step by the medical profession in attempting to find a more adequate examination of the gastrointestinal tract, particularly the lower gastrointestinal tract, and also to prevent the complications of this procedure.

During the last three years several papers have been written by gastroenterologists and radiologists in studying new solutions for study of the colon. This represents two things: (1) a dissatisfaction with some of the present means and (2) a deep interest in more accurate diagnosis. The elusive polyp has caused concern and embarrassment not only to the proctologist but also to the radiologist.

The substance, methocel, has been used with the barium mixture in our hospital, along with other substances, during this last year. In our series of cases we have used the substance with and without tannic acid mixtures. We have varied the technic in several ways recently. There have been no complications with methocel. The clarity of the film adequately proves its usefulness. The distribution in the colon and the pattern of the mucosa appear clear from our studies. The substance seems to be evacuated without difficulty. There is no objectionable reaction. The barium, which has been our sheet anchor for many years, has been used possibly over twenty-seven years in the study of the colon and only in the last few years has the mixture of barium and tannic acid been popular. In the last year the mixture of methocel has become popular in several places; another substance, baridol, has also been used.

The attempt to mix barium with other substances has given a clearer picture on both upper and lower gastrointestinal examinations. I believe that further investigation is indicated in attempting to search for even more accurate examinations. We have found it particularly useful in doing the barium enema examination with a slight modification of the accepted technic. This modification consists of passing the barium through the splenic flexure, then turning the patient on his side and instilling air, completely outlining the colon. This leaves some weak spots in the examination, namely, the cecum, but those who are particularly interested in finding polyps will find that this slight modification is useful. Then take the film in the postero-anterior projection and the anteroposterior projection, with the patient lying on his side, on the right side first and then on the left side, thus bringing out in relief the cecum and the right side of the colon on one view and the sigmoid and the left side of the colon on the other. This in no way discriminates against the routine barium enema. We should do both in certain cases.

In this one modification, filling the splenic flexure with the barium and then filling the rest of the colon with air, we have found that it does not always give a satisfactory view of the cecum. For that reason a separate barium enema examination using conventional technic is often done. The value of this modification is the fact that men may be particularly interested in the rectosigmoid area.

I believe that Dr. Marks' investigations are a distinct contribution to the study of the lower gastrointestinal tract, and we shall observe in the next few years even greater success in the accurate examination of the colon than we have had in the past.

FLUID AND ELECTROLYTE THERAPY IN SURGICAL PATIENTS*

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THIS article is presented as a practical method for the management of water and electrolyte problems in the surgical patient. These principles have been evolved from a study of such patients over the past several years. Although we do not claim originality for all of the underlying ideas, it has seemed best not to make this a review of the literature.

In approaching a patient, we might think of him in the beginning as a container such as a bathtub. The first question we must ask ourselves is, "What is the state of hydration of this individual?" or, "How full is the bathtub?" We are not concerned with the type of fluid present—water, blood, saline. We wish to know the volume and not the make-up of the extracellular fluid. Consequently, chemical determinations upon the blood plasma or serum are usually of little value. It is upon clinical grounds that the state of hydration is ascertained. What is the tissue turgor, eyeball tension, state of the tongue, and is edema found? Is the individual hydrated, dehydrated or edematous? The best means of following the state of hydration is the patient's weight when this is possible. Because many of our ill patients have anemia or hypoproteinemia, specific gravity of the blood, hematrocrit readings and such may be confusing unless pre-existing base lines are available.

Depending upon the source of fluid loss producing dehydration, sodium may be lost to an equal, greater or lesser extent than water. Consequently, with dehydration the serum sodium levels may be normal, low or high. The same applies to chloride and other ions and is one of the chief reasons for measuring the state of hydration from clinical grounds rather than what type of fluid is present in our hypothetical "bathtub."

When chemical procedures for measuring the extracellular compartment (blood volume determinations and the like) become practical for the ordinary hospital laboratory, they will be a tremendous help in this problem. The sodium and chloride output in the urine may be ascertained and used to estimate the state of hydration. However, this is not absolute, for the output varies with the intake and state of renal function. An outstanding example is the low urinary output of sodium seen with edema due to congestive heart failure. The urinary findings indicate a sodium deficit and dehydration; this could cause an error in therapy.

The specific gravity and volume of the urine have also been used as an indication of the state of hydration. This depends to a large degree upon the type and amount of fluid intake. An edematous patient may consume very little fluid and have a concentrated urine. On the other hand, a severely dehydrated patient may be given 4,000 cc. of 5 or 10 per cent glucose in water with no saline a day. Without adequate sodium ion he cannot retain the water. He will therefore put out a large volume of urine with a low specific gravity. Inasmuch as he washes out additional sodium with this large urine volume, he actually becomes more dehydrated.

Of all the commonly employed laboratory procedures, the blood urea nitrogen or nonprotein nitrogen will give the best measurement of dehydration. The circulation to the kidney may be simulated by our original bathtub. When this is filled sufficiently, water will pass out through the overflow, which might represent the kidneys. Here we assume that normal hydration is the top of the tub. In other words, in adequate hydration there is a good blood flow to the kidneys. In dehydration of any clinical importance there is a decreased renal blood flow. As the level in the bathtub falls, there is less pressure forcing fluid out of the overflow. When this occurs there is decreased glomerular filtration with subsequent elevation

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of the non-protein nitrogen. As the individual is hydrated, a sufficient renal blood flow returns and the non-protein nitrogen falls to normal. This test is not infallible but has produced the best correlation. The clinical picture should be combined with the non-protein nitrogen, for the latter may be elevated in congestive heart failure. Although this is due to decreased renal blood flow, the administration of sodium ion in this case is not usually indicated. Pre-existing renal disease or accompanying lower nephron nephrosis may be chiefly responsible for altering the non-protein nitrogen in the case under study. Here again the amount of rehydration is gaged clinically; and if the non-protein nitrogen does not fall, one of the aforementioned is suspected. There may, however, be some decrease in non-protein nitrogen due to correction of prerenal azotemia superimposed upon an organic renal lesion. In any event the individual should be adequately hydrated but not made edematous.

The volume of extracellular fluid or degree of hydration indicates the amount of sodium the patient will require. A sufficient number of liters of normal saline should be administered until he is adequately hydrated.

In the majority of electrolyte disturbances normal saline may be given and most of the difficulties will be corrected. This is brought about by an adequate kidney which is capable of retaining the necessary ions and eliminating those that are not needed. However, as cited previously dehydration may produce impaired renal function, or in some instances organic kidney disease may be present. In such cases both the type and amount of ions necessary should be estimated. This may apply to water as well. The damaged kidney may not be able to sort out the required ions nor rid the body of an excessive amount of water or ions administered. Therefore, at this point the status of renal function should be estimated. Analysis of intake and output charts should take both sodium and water into consideration comparing them to the specific gravity and volume of the urine. The non-protein nitrogen will usually suffice as a laboratory procedure. Occasionally with suspected renal disease the individual must be adequately hydrated before this point can be settled. The usual differential diagnosis will be between prerenal azotemia and lower nephron nephrosis. The latter is generally characterized by a small urine volume with a low specific gravity. With prerenal azotemia the volume may be small with a high specific gravity or a large volume with a low specific gravity, all depending upon the amount of water given without sodium. However, as mentioned before, dehydration if present

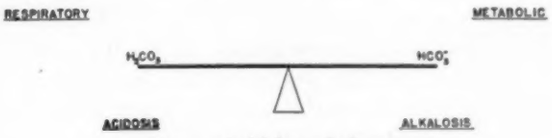

FIG. 1. Acid-base balance.

should be corrected regardless of the factor responsible for renal impairment. Rehydration must be carried out cautiously to prevent overhydration. The correction of dehydration is the best method to settle the question of prerenal azotemia versus organic renal disease.

The status of renal function will determine whether normal saline alone will suffice or if a more accurate analysis of the ions required should be made. The latter is the case with organic renal disease.

Now, when one knows how full the bathtub is and whether the overflow is working, he analyzes what is in the tub. In other words, the state of hydration and renal function having been estimated, it is time to measure some of the ions in the blood. First is the solution acidic or basic? This is necessary, for death will ensue if the blood diverges too far either way. The pH of the blood, degree of acidosis or alkalosis, is controlled by the blood bicarbonate ion (CO_2 combining power) balanced by the carbonic acid dissolved in the blood. The latter is influenced by the ventilation of the lungs. If carbon dioxide is blown off by increased ventilation, the carbonic acid level in the blood falls. The bicarbonate ion is a very labile one which adds to the other anions present to keep them equal to the cations. Consequently changes in the bicarbonate ion are usually caused by alterations in some of the other anions such as chloride, organic acids and so forth.

The problem of acidosis or alkalosis may be expressed by the Henderson-Hasselbalch equation, $pH = pK + \log \frac{HCO_3^-}{H_2CO_3}$. This may be approximated in terms of a teeter-totter. (Fig. 1.) If the right side is depressed, alkalosis occurs; if the left side falls, acidosis is produced. This balance may be altered by changes

in either side. If they begin on the left, they are due to alteration in aeration of the lungs; if they begin on the right, they are caused by metabolic disturbances. The latter are usually encountered in surgical patients. A common situation is seen following nasogastric suction. Chloride ion is lost, and if insufficient replacement is given, the level of this ion in the blood falls. The HCO_3 ion expands to fill this deficit. Consequently the teeter-totter becomes depressed upon the right side producing alkalosis. The body attempts to correct this by increasing the left side. To do this the lung ventilation is decreased and the dissolved carbonic acid in the blood is built up. This brings the teeter-totter back toward its original position. This is called compensated alkalosis. Because the initial change took place on the right side or in the bicarbonate ion, this is metabolic alkalosis. The reverse occurs in acidosis. In the example just cited, although the chloride ion has caused the difficulty, it is the disturbance in acid-base balance which is important. In diabetic acidosis the organic acids build up in the blood which decrease the HCO_3 ion. However, the chloride ion is also depleted at the same time. Consequently here are two different situations, one of alkalosis and the other of acidosis. The chloride ion would be low in both instances, therefore, the chemical test to use is the CO_2 combining power and not the serum or blood chloride.

Further difficulties may arise from examination of the urine. Most patients with metabolic alkalosis are dehydrated. The kidney attempts to preserve the state of hydration ahead of the acid-base balance. Therefore, even though severe alkalosis is present the kidney reabsorbs almost all of the sodium from the urine and an acid urine is found. In this same case dehydration may have caused renal impairment to the degree that less than the normal amount of chloride ion is reabsorbed. Here one may find a dehydrated patient in severe chloride deficit still excreting 1 to 2 gm. of chloride in the urine per twenty-four hours with no chloride intake. When blood pH determinations become more widely used, they will greatly assist this problem of acid-base balance.

The state of acid-base balance in the blood determines the type of anion to be given. Alkalosis indicates one which will decrease the HCO_3 ion, and chloride is the one of choice. With renal impairment this may have to be given with a cation which is metabolized such as NH_4. In alkalosis a combustible anion such as HCO_3 or lactate is used. However, if the kidneys are working well, saline itself will probably suffice in either case.

As far as those imbalances due to respiratory disturbances are concerned, the changes in the HCO_3 ion are compensatory. Therefore, one should not attempt to correct the abnormal blood chemistry in these cases.

The next determination to be done would be the serum potassium. This is usually decreased due to lack of intake for five days or longer, with a continued loss in the urine of 0.5 to 1.0 gm. of potassium per day. Asthenia, paresthesias and muscle weakness are suggestive signs of deficit; occasionally ileus or cardiac abnormalities may appear. This deficit should be corrected by the administration of potassium chloride. If renal impairment is present, this must be used with caution, and in some instances high serum levels will be found initially and potassium will be contraindicated. Diarrhea, alkalosis and other conditions may accentuate or cause a potassium deficit. Since potassium alters the electrocardiograph, this procedure can be used to follow potassium levels.

In rare cases serum levels of calcium and magnesium may be measured and corrected if low. Only in rare patients with renal impairment will a serum sodium be of any practical help. To reiterate, the serum chloride is only important insofar as it alters the HCO_3 ion. Consequently a chloride determination rarely contributes much to what is already shown by the aforementioned tests, and at times it may be confusing.

We have attempted to describe a method of evaluating a patient with an electrolyte disturbance in order to determine what therapy is necessary. Prophylaxis is, however, the best procedure to follow and one plan for such will be outlined.

Table 1 is suggested for the patient who is not eating and whose electrolytes and water must be controlled by parenteral administration. The urine volume, in the absence of renal disease, will indicate the amount of water intake necessary. The urine volume should be about 1,000 to 1,500 cc. Sufficient water as glucose or amino acids in water without saline should be given to produce this.

Next, the amount of suction should be

measured and 1 L. of normal saline given for each liter of gastrointestinal fluid removed plus 500 cc. of normal saline for ordinary maintenance. To keep a check on the state of hydration the patient's weight is the best

2. The state of hydration is best measured by clinical appearance of the patient and the non-protein nitrogen. Dehydration requires saline for its correction. One to five liters or more may be necessary; the patient's clinical

TABLE 1

CHART FOR MANAGING A PATIENT ON PARENTERAL FEEDING

Intake		Output		Intake		Blood Chemistry			Intake			Blood Chemistry
Oral	Intravenous	Urine	Suction	Saline	Weight	Non-protein Nitrogen	CO_2	K	KCl	CHO	N	Albumin
Water		Saline						KCl	Nutrition			

procedure. Inasmuch as most patients now receive early ambulation, this becomes more feasible. About 500 cc. of normal saline equal 1 pound of weight provided adequate nutrition is maintained. A further check, or an alternate at times, is the non-protein nitrogen done two to three times per week. A CO_2 combining power often will indicate whether adequate saline is being given and the kidneys are doing their job. Two to four grams of potassium chloride per day placed in the aforementioned intravenous solutions will maintain an adequate balance in most cases. The serum potassium may be run one to two times per week to be certain. With renal disease the potassium must be followed more closely. All of these factors should be balanced for proper management.

Along with these chemicals an adequate amount of carbohydrate and protein should be given, for at times the problem of nutrition may complicate the electrolyte one. The blood albumin will give the most information here.

SUMMARY

1. To treat a patient with a disturbance of electrolyte and water metabolism the following should be determined: What is the state of hydration? What is the state of kidney function? What is the state of the acid-base balance? What is the concentration of individual ions?

course and non-protein nitrogen will regulate this. Edema contraindicates saline.

3. The kidney function is investigated by the non-protein nitrogen along with urine volume and specific gravity compared to intake of water and sodium. Correction of dehydration may be necessary to evaluate renal function adequately. Without renal impairment normal saline will correct most situations. With such impairment special parenteral solutions may be necessary.

4. Acid-base balance is best indicated by the CO_2 combining power. This state will determine what special solutions are necessary for correction with renal impairment. One to two liters of M/6 sodium lactate are used for acidosis and 0.9 per cent ammonium chloride, 1 to 2 L., is usually given for alkalosis.

5. Potassium is usually the only individual ion whose concentration need be measured. After five days or more there is frequently a deficit for which the administration of 5 to 20 gm. of potassium chloride may be necessary over one to several days. With renal disease this must be used cautiously, and at times is definitely contraindicated. Rarely serum calcium and magnesium readings will be done and deficits are corrected by calcium gluconate or chloride and magnesium sulfate.

6. Finally, one method of prophylaxis is outlined. This is deemed the best course to follow.

RESULTS OF SIGMOIDOSCOPIC EXAMINATIONS AT A CANCER DETECTION CENTER*

A TWO-YEAR STUDY

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THE Cancer Detection Center in Minneapolis, Minnesota, was planned and organized at the University of Minnesota Hospitals in March, 1948, in order to determine the effectiveness of specialized clinics to detect precancerous lesions and early malignant lesions. The project has the approval of the Minnesota State Medical Association and is financed jointly by the Minnesota Division of the American Cancer Society, the U. S. Public Health Service (through the State Department of Health) and a Malignant Disease Research Fund of the University of Minnesota.

The Cancer Detection Center is designed to serve apparently well persons primarily to detect in them early cancer, precancerous lesions and areas of chronic irritation which might lead to cancer. Any individual over the age of forty-five is eligible for admission providing he or she has no specific complaint.

Patients come to the Center by appointment only. In addition to a complete physical examination and other special examinations a sigmoidoscopic examination is done on each patient. Barium enemas are ordered on those individuals with unusual findings by proctoscopic examination such as polyps, adenomas and ulcers, and on those patients with occult blood in the stool, those with unexplained hemoglobin level below 11.0 gm. and those with a strong family history of cancer of the large bowel.

At the end of two years' operation of the clinic it is apparent that the most significant findings resulted from routine sigmoidoscopic examinations, specifically the detection of adenomas of the terminal portion of the colon. The adenomas reported in this study appeared to the examiners to be hyperplasia of the normal mucosa or true epithelial tumors. There were single and multiple lesions found as well as sessile and pedunculated lesions. Usually they appeared as a slightly raised or elevated lesion on the mucous membrane, 1 to 3 mm. in diameter, and frequently presented no distinguishing appearance from the normal mucosa except for the elevation. The larger lesions which were seen are believed to be an increase in size of these adenomas and are more reddened in color assuming the dusky, reddened, lobulated appearance of the typical adenomatous polyp.

Most adenomas are flat or sessile, but as they develop and increase in size they become pedunculated. These adenomas are the so-called acquired types consisting of single or multiple polyps developing as a single tumor of the mucosa in contrast to familial polyposis of the colon. It has been shown that of the numerous polyps diffusely scattered throughout the colon in familial polyposis all are true adenomas and differ in no way, grossly or microscopically, from the single adenoma found in the large intestine.

According to Helwig[1] one person in five who reaches the age of sixty has an adenoma of the large intestine. Helwig's figures are obtained from 1,460 consecutive autopsies which did not include cases of familial polyposis. He found that beginning with the fourth decade there was an appreciable increase in the incidence of adenoma, with the maximum being reached in the seventh decade in which 24 per cent of his patients were found to have one or more adenomas of the colon.

The over-all incidence of adenomas found by Helwig in his study was 9.5 per cent. In a series of 7,000 consecutive autopsies at the Cook County Hospital Lawrence[2] found an incidence of 2.3 per cent. Adenomas were found with the greatest frequency in the sigmoid colon and rectum, and it was estimated that approximately 70 per cent were within the

* The results are of sigmoidoscopic examinations at The Cancer Detection Center, University of Minnesota Hospitals, Minneapolis, Minn.

reach of the 25-mm. sigmoidoscope. Estimates of the incidence of adenomas vary greatly with the type of material used for investigation. Very different statistics on the incidence of adenomas discovered are quoted in the literature as a result of clinical symptoms rather than those obtained from autopsy specimens. Brust[3] has reported that only 20 per cent of his patients with benign polyps presented symptoms referable to the tumor. This has also been true in our experience. Rectal bleeding is the outstanding symptom of adenoma of the colon. Usually the bleeding from a polyp is small in amount and is frequently mixed with mucus. In examinations at the Cancer Detection Clinic if flecks of blood or bloody mucus are seen as high as the proctoscope can reach, it is indicative of a pathologic condition higher in the colon and a very diligent search with x-ray is made to find the lesion. Nearly all the adenomas of the rectum and sigmoid colon which were discovered on these examinations were incidental findings. There were no symptoms elicited from the patient referable to these benign tumors. They are usually too small to produce any appreciable amount of mucus and are difficult to traumatize because of their small size. They remain silent. The adenomas producing symptoms at the time of their discovery (usually bleeding) are invariably found to be pedunculated and larger in size. In the majority of instances a single polyp or adenoma is present.

Adenomas of the large intestine are true tumors and possess very definite malignant properties. Although the preceding fact has been generally recognized, sufficient emphasis has not been stressed on the importance as well as potential danger of these lesions. Discovery at the earliest moment and prompt eradication must be practiced if cancer is to be prevented in the rectum and rectosigmoid region. This can be accomplished only by a thorough sigmoidoscopic examination.

All physicians and surgeons must be aware of the potentially malignant nature of these tumors and their frequency of occurrence. All must be prepared to search for them, not depending on those few surgeons trained in proctology to cover this most important phase of diagnostic medicine.

There is no way of determining either by gross appearance or microscopic examination which adenomas will remain benign or which may later undergo malignant change. We do know they frequently undergo malignant change but the exact percentage is not known since adenomas are usually eradicated upon discovery. The occurrence or location of adenomas and malignancies is remarkably similar in that both occur with greater frequency in the sigmoid and rectum than elsewhere in the bowel. A further relationship is noted in that the appearance of adenomas accompanies the general cancer age group. Swinton and Warren[4] have demonstrated histologically that malignancy does develop from an adenoma. The frequent coexistence of both benign and malignant processes in the same individual and the proximity of these growths further substantiate the close relationship between intestinal adenomas and malignancy.

We do not want to give the impression that all cancers of the rectum and colon arise from adenomas because this is not the case; however, we do want to emphasize the importance of the so-called benign adenoma. Some authors have placed the incidence of malignant change at 20 per cent and others at 14 per cent. Helwig stated that the same inherent growth factors which apparently cause the development of malignant disease cause the formation of the benign but definitely premalignant tumors of the colon and rectum, particularly in those of advancing years.

RESULTS OF STUDY

In the two-year period from March, 1948, to March, 1950, 2,226 new patients were examined sigmoidoscopically and 1,039 have returned for re-examination. Adenomas were found in 274 cases or 12.3 per cent of the new patients and seventy-nine cases or 7.6 per cent of the re-examined patients, making a total of 353 cases.

Of the 353 cases, ninety-seven or 27.5 per cent had two or more adenomas whereas 256 or 72.5 per cent had single lesions. Adenoma occurred more frequently in the males, the ratio being 3:2. The average age in this series was 55.7 years. (Table 1.) The number of patients with adenomas discovered at the first visit to the Clinic was 274. The number of patients with adenomas discovered for the first time at the second or third visit (all patients are re-examined at six- to 12-month intervals) was seventy-nine.

Of all the patients who had adenomas, 112

have thus far returned for re-examination. In eighty-five cases the lesions were absent. Of these, sixty-five patients were adequately cared for by their private physician and/or a specialist while twenty patients were without benefit of therapy. The absence of the twenty adenomas may represent inaccurate original diagnoses or incomplete re-examination. In the remaining twenty-seven cases no treatment had been instituted and the lesion was again demonstrated; four were known to have increased in size. Also, in twenty-four cases in which the patient had obtained adequate treatment attested to by his physician adenomas were discovered at re-examination, which probably represents additional growths but which, of course, may have been overlooked at the initial examination.

TABLE 1

MULTIPLICITY OF ADENOMA

Number of patients found with adenoma on first visit		274
Single adenoma found	199	
Two or more adenomas found	75	
Number of patients with adenomas found for first time at second or third visit to the Clinic		79
Single adenomas found	57	
Two or more adenomas found	22	
Percentage of multiple lesions		27.5
Percentage of single lesions		72.5

Biopsy was performed on the larger, polypoid, irregular growths. Fifty-six biopsies were performed which were reported as forty-eight benign lesions, three malignant growths, three inflammatory pseudopolyps and two as normal rectal mucosa.

Barium enema, including air-contrast studies, were performed on all 353 patients. The study was negative in most instances; however, several patients had suspected colonic lesions such as a filling defect representing a tumor mass, polyps elsewhere in the colon and constricted areas in the large intestines.

The size of the adenomatous lesions varied a great deal. There were 474 separate lesions taken into consideration. Of these, 430 were less than 1 cm. in diameter, thirty-eight were 1 to 2 cm. in diameter (one proved to be a malignant growth), and six were larger than 2 cm. in diameter (two of these proved to be malignant).

TREATMENT

All benign asymptomatic adenomas should be removed soon after their discovery. Those within reach of the 25-mm. sigmoidoscope may be removed safely either by direct fulguration or, where there is a definite pedicle, by ligation or high frequency electric snare. Local surgical excision is also adequate but is employed especially for lesions situated above reach of the endoscope. The sessile tumors are usually biopsied before they are destroyed by fulguration and the pedunculated growths which are removed are preserved for microscopic study. Care must be exercised to avoid perforation of the bowel above the peritoneal reflection and also to avoid hemorrhage from the artery which is present in the stalk of the larger polyps. All but the very large benign polyps or those tumors above the peritoneal reflection may be removed as an office procedure.

Thorough, intense fulguration including the bowel wall for lesions below the peritoneal reflection is not looked upon with too much danger and may be indicated to insure total eradication of a sessile growth. The sessile growths above the peritoneal reflection that can be reached by the sigmoidoscope, if fulgurated, must be closely and frequently followed as there is a tendency to destroy these growths inadequately for fear of perforation. If there is doubt as to complete eradication or if they are firmly attached to the bowel wall and not just to the mucosa, they are best removed by the abdominal approach. The pedunculated adenomas, even with focal malignant changes but without evidence of invasions of the stalk or mucosa, can be removed effectively by electrothermy.

Adenomas showing invasion[5] into the rectal wall should be regarded and treated as frank carcinomas and it must be borne in mind that treatment of cancer of the colon and rectum is radical resection.

In many cases fulguration of polyps or adenomas has been considered to be a failure because at a later date carcinoma has been found. This is not the fault of the method of destruction but in lack of methodical follow-up procedure. In other words these cases must be checked frequently for a long period of time. The factor that produced these growths is not destroyed by the fulguration of them. It may still be active and produce new ones. We have ample proof that this factor is still present because we have found many additional adenomas in re-examination of patients not at the same site but in various other parts of the bowel.

As to the after-care of these patients who have an adenoma or a polyp, they should never be dismissed completely after fulguration or destruction of an adenoma or polyp. If the patient and doctor are to prevent the development of cancer in the terminal portion of the colon, a definite program of postoperative care must be carried out over a period of years.

CONCLUSION

No definitive treatment is carried out in this Cancer Detection Center; however, if any cancer or precancerous lesion is found, the patient is told to return to his personal physician so therapy may be instituted. Detailed analysis of our results, both positive and negative, is sent to the personal physician so that he may be fully aware of our findings. Each patient must give the name of some physician who is approved by the State Medical Association to whom we report our findings. It can thus be seen that the early results of our studies at the Cancer Detection Center have been most encouraging with regard to the routine sigmoidoscopic examination of these clinically symptom-free patients. It is generally known and is an accepted fact that malignancies of the colon very often originate from lesions which were previously considered insignificant such as the adenoma. This was the type of lesion which was seen most frequently in this study, in which the prognosis is excellent and the method of treatment is relatively simple.

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ROUTINE EXAMINATION OF THE LOWER BOWEL*

RESULTS IN 500 ASYMPTOMATIC PATIENTS

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ROUTINE sigmoidoscopy was performed on 500 new adult patients who had no complaints referable to the lower bowel. These patients were questioned about their histories and were subjected to a thorough physical examination by an internist who also asked the usual questions regarding the lower bowel and performed a digital examination of the rectum. Only those patients who did not present any specific indication for examination of the lower bowel were included in this series. Even patients who complained of minor degrees of constipation and other minimal symptoms which ordinarily would not have occasioned consultation with a proctologist were nevertheless eliminated from the series. If anything of a suspicious nature was discovered by digital examination, the case was not included.

TABLE 1

Routine Sigmoidoscopy	No. of Patients	Percentage of Total	No. of Females	No. of Males
Asymptomatic patients examined.....	500	100	318	183
Patients showing lower bowel lesions.....	138	27.6	78	60

When the patient reported for sigmoidoscopy, a careful history referable to the lower bowel was again taken; this included considerably more detail than the usual medical history. If this interrogation revealed bowel symptoms which were not recorded by the internist, the patient was included because it was thought that proctologic consultation would not have been specifically recommended in this instance. Of the 500 patients who satisfied these conditions, 138 or 27.6 per cent were found to have lesions of the lower bowel. (Table 1.)

Slight deviations from normal such as small hemorrhoids, deepened crypts and moderately hypertrophic papillae were not included in the tabuation. In many instances it was difficult to evaluate disease, and some interesting points were brought up in this connection. It must be remembered that this group was supposedly asymptomatic and therefore should present few abnormal findings. However, the vagaries of human nature must be considered. These seemed to fall into three main groups: Group I designates that class of patients who had admitted no symptoms to the internist but who subsequently on careful questioning by the proctologist confessed reluctantly that this or that symptom probably had been present from time to time. Group II included those individuals who denied emphatically the presence of symptoms both to the internist and the proctologist. However, when informed that the examination revealed a condition which certainly must have caused symptoms, these patients would reluctantly admit that probably they did have such or such symptoms at times. Group III was the stoic group. These people still denied symptoms after being confronted with evidence that such could not possibly be absent. The answer to what makes people fall into these groups might constitute an interesting study in psychology. The majority of these patients are of the "white collar" class, who might be presumed to have a rather high level of intelligence. Natural reticence in discussing matters pertaining to the "back passage" and fear of surgery are undoubtedly motivating factors in most instances. In Group III there was undoubtedly a small number of patients of stoic nature possessing a high threshold to pain and who were suffering from a condition which had a slow, gradual onset. Possibly, some of these had honestly accepted conditions which would be productive of extreme misery in others as being quite normal attributes of human existence.

The patients regarded as having lower bowel

*From the Yater Clinic, Washington, D. C.

disease fell into the diagnostic groups indicated in Table II.

A large proportion of the adult population is found to have hemorrhoids which, for the most part, are asymptomatic. Therefore, one does not consider small internal or external hemorrhoids particularly abnormal. Only large hemorrhoids which in my estimation would produce symptoms under ordinary circumstances were included. (Table III.) It is my belief that hemorrhoids are seldom detrimental to life or health. The usual objectives of treatment are relief of annoying symptoms and prophylaxis against future symptoms. These were carefully explained to every patient in this group and in no instance was treatment urged.

TABLE II

Diagnosis	No. of Patients	Percentage of Patients Showing Disease of Lower Bowel	Percentage of Total No. of Patients Examined
Hemorrhoids	64	46.4	12.8
Polyps	44	31.9	8.8
Diverticula	9	6.5	1.8
Fissure	8	5.8	1.6
Hypertrophic papillae	7	5.1	1.4
Pruritus ani	7	5.1	1.4
Cancer of the lower bowel	5	3.6	1.0
Fistula	4	2.9	.8
Rectal prolapse	4	2.9	.8
Melanosis coli	3	2.2	.6
Condylomata acuminata	2	1.4	.4
Non-specific proctocolitis	2	1.4	.4
Squamous cell metaplasia	1	.7	.2
Stricture	1	.7	.2
Rectocele	1	.7	.2
Radiation proctitis	1	.7	.2
Blumer's shelf	1	.7	.2

It has been well established that the presence of diverticula may be detected by sigmoidoscopic examination. This was demonstrated in this series by the finding of evidence of diverticula in nine patients in whom the diagnosis was later confirmed by x-ray examination. One case was that of a seventy-four year old woman who had suffered from bladder irritation for ten years. She had been under the care of a competent urologist and repeated studies had failed to reveal the cause of her symptoms. Marked improvement followed medical treatment of the diverticulitis. In another case a large, solitary diverticulum was found bulging into the pouch of Douglas from the anterior wall of the rectum 11 cm. from the anus. A probe could be passed through the opening into the diverticulum. No treatment was deemed necessary. It is reasonable to assume that these cases would have remained undiagnosed if routine sigmoidoscopy had not been performed. (Table IV.)

TABLE III

Hemorrhoids	Internal Hemorrhoids	External Hemorrhoids	Internal and External Hemorrhoids	Totals
No. of cases	6	3	55	64
Percentage	9.4	4.7	85.9	100
Treated with injection	4	0	0	4
Treated with surgery	0	0	1	1

Anal fissure was discovered in eight instances. All of these showed deep ulceration with hard, indurated, fibrotic margins and indolent bases with excavation of the edges. In all cases bleeding could readily be produced by light swabbing. However, all of these patients steadfastly denied symptoms, a fact that was extremely difficult to understand. Surgery was urged in all these cases, but all of the patients refused it.

Seven patients were found to have anal papillae which had hypertrophied to the point where prolapse through the anus was evident on straining. Excision was recommended in all cases and carried out in one.

Characteristic skin changes of pruritus ani were noted in seven patients. On subsequent questioning five of these admitted that they had suffered with various degrees of itching. Conservative treatment was recommended.

Four cases of uncomplicated anorectal fistula were encountered. No history of previous abscess or symptoms could be elicited. Operation was urged in each instance and accepted by one patient.

Rectal prolapse was seen in four patients. All expressed considerable surprise when informed of it. Injection treatment was urged in all of

these cases and was performed on three patients with excellent results.

The typical picture presented by melanosis coli was observed in three instances. Subsequently the patients admitted taking cascara on frequent occasions.

exposed to irradiation of the uterus eleven years previously showed radiation proctitis. A large rectocele was discovered in an elderly woman.

A forty-four year old man was found to have a well defined Blumer's shelf. This patient was

TABLE IV

Diverticula of the Large Bowel	Age	Sex	Sigmoidoscopic Findings: Visible Diverticulum	Sigmoidoscopic Findings: Narrowing, Fixation, Thickening, Loss of Elasticity (Lower Sigmoid)	Diagnosis	Symptoms
Case I.....	74	F	No	Yes	Diverticulitis colon	Bladder irritation
Case II.....	68	M	Yes	Yes	Diverticulitis colon	Vague abdominal discomfort
Case III.....	82	F	Yes	No	Diverticulosis rectum	None
Case IV.....	44	M	No	Yes	Diverticulitis colon	Vague abdominal discomfort
Case V.....	28	M	Yes	No	Diverticulosis colon	None
Case VI.....	54	F	Yes	No	Diverticulosis colon	None
Case VII....	36	F	No	Yes	Diverticulitis colon	Vague abdominal discomfort
Case VIII....	38	M	No	Yes	Diverticulitis colon	Two episodes of abdominal cramps
Case IX.....	44	M	Yes	No	Diverticulosis colon	None

Large accumulations of condylomata acuminata were seen in two cases. Both patients insisted they were unaware that an abnormal condition existed and steadfastly denied all symptoms. Surgical excision was recommended and accepted by both patients.

Two patients with non-specific proctocolitis exhibited essentially the same picture, namely, slight injection and edema of the mucosa with infrequent, small, clean, shallow ulcers in the rectum and sigmoid. Extensive laboratory examination failed to establish a specific etiologic factor. In both cases the bowel returned to normal within a month without treatment.

A stricture was discovered in a sixty-one year old woman. This was located just above the pectinate line and would not admit a proctoscope of ½-inch diameter. The undersurface showed raised, white areas on the mucous membrane which were found on microscopic examination to be squamous cell metaplasia of the rectum.

A sixty-one year old woman who had been later found to have carcinoma of the stomach with metastasis to the rectovesical pouch.

It is well established that polyp of the large bowel is a precancerous lesion. Therefore, it

TABLE V

	Rectum		Recto-sigmoid	Sigmoid
Inches from anus.....	1–3	3–6	6–8	8–14
Anterior wall.....	4	10	5	2
Posterior wall.....	1	14	3	1
Lateral walls.....	1	9	3	2
Total.....	39		11	5
Percentage.....	70.9		20.0	9.1

would appear that the present answer to the problem of cancer of the bowel is the discovery and treatment of the premalignant polyp. This can be accomplished only by subjecting the asymptomatic patient to adequate examination of the lower bowel. The data on polyps ac-

cumulated in this study substantiate this. Of 500 patients examined, forty-four or 8.8 per cent of this asymptomatic group were discovered to have one or more polyps of the large bowel. None of the polyps was detected by digital examination. The location of the polyps

TABLE VI

Size of Polyps	1 mm. to 5 mm.	5 mm. to 1 cm.	1 cm. to 2 cm.	2 cm. to 3 cm.	3 cm. to 4 cm.	Over 4 cm.
Number.....	31	14	7	1	1	1
Percentage...	56.4	25.4	12.7	1.8	1.8	1.8

TABLE VII

No. of Polyps	1	2	3	4
No. of patients.....	36	6	1	1
Percentage.....	81.8	13.6	2.3	2.3

is shown in Table v and the size in Table VI. Multiple polyps occurred as indicated in Table VII. All small polyps were treated with fulguration without preliminary biopsy. Patients returned for re-examination in two months and thereafter yearly. Barium enemas are ordered in all cases in which polyps are found. Microscopic examination is carried out on all polyps measuring more than 0.5 cm. regardless of gross appearance.

Cancer of the lower bowel was found in five patients or 1 per cent. This is quite surprising when one considers the fact that we are dealing with a strictly asymptomatic group. One case was that of a forty year old doctor in whom a polypoid growth was found 7.5 cm. from the anus on the anterior wall of the rectum. This measured 1.5 cm. in diameter and was attached to the bowel by a fairly broad pedicle measuring 0.5 cm. It was soft, freely movable and presenting nothing remarkable in its appearance. Grossly, it appeared benign. The growth was snared off so close to the base that a barely discernible elevation marked its location. Microscopic section showed adenocarcinoma, grade II, extending throughout most of the specimen but shading off to grade I at the base. An elliptical excision of the growth and surrounding bowel wall was done. Over 300 serial sections through this specimen were carefully examined and no malignant change was observed. It is assumed that a small intervening section of the growth between the snared specimen and the bowel wall sloughed as a result of the snaring and that the malignant process had not yet advanced beyond this point. No further procedure was done. The patient has been followed up carefully; nineteen months following surgery there was no evidence of recurrence. It is logical to suppose that the bowel wall would have been invaded shortly and radical resection of the bowel would have been necessary to save the patient's life. (Table VIII.)

All the patients in this group were operable. In no instance had the growth spread beyond the confines of the bowel and in no case was metastasis to regional lymph nodes discovered. At this writing all of these patients are alive and show no evidence of recurrence. Because the survival time is short, no definite conclusions can be reached. I believe, however, that the chances of permanent cure are excellent in all

TABLE VIII

Cancer of the Lower Bowel	Age	Sex	Centimeters from Anus	Gross Appearance	Microscopic Diagnosis	Treatment	Remarks
Case I....	82	M	20	Large, flat, cauliflower	Grade II adenocarcinoma	Refused	None
Case II....	57	M	20	Large annular	Grade III adenocarcinoma	Miles' abdominoperineal resection	Well 1 yr.
Case III...	33	F	13	Large, flat, papillary	Grade I adenocarcinoma	Segmental resection and anastomosis	Well 9 mo.
Case IV...	40	M	7.5	Small, polypoid	Grade II adenocarcinoma	Local excision	Well 1½ yr.
Case V....	60	M	18	Large, annular	Grade II adenocarcinoma	Miles' abdominoperineal resection	Well 1¼ yr.

of these cases. It cannot be denied that this group presents a much more favorable prognosis than if the lesions had not been discovered until after the onset of symptoms.

SUMMARY

1. Sigmoidoscopic examination is performed on all new adult patients who undergo general examination at the Yater Clinic.

2. Records of 500 patients who did not complain of symptoms pertaining to the lower bowel have been accumulated and the data regarding lesions of the lower bowel reviewed.

3. A significant number of these patients were found to have cancer, precancerous growths and other lesions of the lower bowel.

DISCUSSION OF PAPERS BY DRS. CHRISTIANSON AND TENNER, AND YOUNG

WILLARD H. BERNHOFT (Buffalo, N. Y.): Since I did not know how the papers by Drs. Christianson and Tenner, and Young were going to appear on the program, I prepared separate discussions. I will discuss the paper of Drs. Christianson and Tenner first.

Although it is true that only symptom-free patients are examined at the cancer detection centers, it is my belief that many patients with symptoms go for examination and do not admit having them. I know that to be true in Buffalo as some of my patients have gone to the clinic and later told me. For this reason plus the older average age groups of 55.4 years, as Dr. Tenner also presented, his finding 12.5 per cent of patients with adenomas is not too surprising although this is a bit higher than we and many other examiners throughout the country have found. From the Strang Clinic in New York, Dr. Michael Deddish told me a couple of years ago that the figures at the detection center were somewhat between 6 and 8 per cent.

I wish to report briefly a study of 653 sigmoidoscopies which we have done in private practice. This series does not include any of those which I will report in discussing Dr. Young's paper. These cases include only those in which digital examination was negative. Definite carcinomas which could be easily diagnosed by digital examination or by x-ray studies previously done are not included.

The average age of these patients was 42.5 years. Adenomas were found in fifty-eight cases or 8.9 per cent. The number of cases giving rise to no symptoms which would make one suspect a polyp were forty-two; in other words, 6.4 per cent of our patients had no symptoms which would make us suspect a polyp.

Of those forty-two, two showed a definite area of malignant transition. There were sixteen patients or 2.5 per cent in the series who presented symptoms that would make us suspect the possibility of polyps, one or more. The interesting thing here is that of these sixteen, eleven or 58.8 per cent of that small group were malignant. The five which showed no malignant change histologically at the time of examination were as follows: two villous polyps (one of these showed areas of atypical cells but no adenocarcinoma and the other was benign throughout), one solitary adenoma of the sigmoid which was removed by colotomy in a body twenty-two years of age and two cases of familial polyposis in boys of eighteen and twenty-two years, respectively. I think these figures speak for themselves as to the value of early diagnosis of adenomatous lesions of the rectosigmoidal region. As symptoms develop we are apt to see more evidences of the malignant transition.

Dr. Christianson mentioned biopsy of some of these lesions and stated that that was in the larger ones. I would like to comment briefly on this point and re-emphasize what has been mentioned by others. Whenever possible I believe the adenoma should be removed completely at the time of examination and the entire lesion, as far as possible, examined histologically. It is only in this way that we can intelligently handle these cases. If we biopsy, particularly with a cold punch, and pass through a nest of malignant cells, I believe it is highly possible for them to become squeezed into the vascular system. Where biopsy is necessary, deep fulguration of the biopsied area should be done immediately.

I agree with the doctors concerning their follow-up of cases. We must, however, be practical in our attitude. I am one who believes that all adenomas, given time, will become malignant. Therefore, I am guided by the age of the patient and the histology of the adenoma as to how long to follow up individual patients or how frequently to see them. For example, a patient seventy years of age with an adenoma which is entirely benign I do not feel is necessary to follow up as carefully as if that patient were thirty years of age because, as the doctor stated, patients may have inherent tendencies to develop another polyp as they developed their original one.

Since the paper which I am discussing is primarily one of diagnosis, I have purposely omitted any remarks as to management of various histologic types of adenomas. It may be on the basis of the amount of malignant transition which is present, and this requires a very close collaboration between the clinician and the pathologist. The latter has to know the clinical background of each patient before he can render a report which will not stagger the clinician, particularly when we are dealing with transitional lesions. This, however,

will cease to be a problem as more of these adenomas are picked up on routine examination and are not left to be found on indicated examinations.

Dr. Young's report represents the advantage of a clinic or group type of practice and also amplifies the importance of complete proctologic examination as a part of routine physical examination. In many of the conditions which the doctor found it is not surprising that the patients were symptom-free, particularly those with small polyps, diverticula which were uncomplicated, melanosis coli, rectocele, Blumer's shelf and even proctocolitis which was not advanced or rectal prolapse which was not complete.

When large hemorrhoids or inflammatory anorectal disease is present or when more inflammatory types of lesions are present in the anorectal area, it is hard to understand why the patients are free of symptoms. It is undoubtedly on the basis of individual sensitivity to pain and pressure.

Nearly every patient whom we have examined will many times present one of two extremes. They will have minimal pathology with a large number of complaints and very severe pain; others with maximum pathology have very little difficulty from the standpoint of symptoms.

Dr. Young did not mention the length of the tract in his fistula cases. I doubt if these fistulas were secondary to anorectal or ischiorectal abscesses. I have seen short tract anorectal fistulas develop shortly after birth, secondary to infection in the anal glands which, of course, may heal at times spontaneously but at other times will fail to do so and will necessitate surgery in childhood. If these patients are not operated upon at this time, I can understand why they may go into middle life without ever knowing when the original infection developed.

Because most of the patients whom I see have rectal complaints, I am able to discuss statistically only the pathologic condition found on routine sigmoidoscopy. This is of much interest to me because I believe in our busy practice we may do only those examinations which we believe are indicated on the basis of history or whether we are going to do any anorectal surgery. It has been one of our cardinal principles that we should never do anorectal surgery without previous sigmoidoscopy, but what about the unindicated sigmoidoscopic examinations? We have selected 1,000 cases which on the basis of history and anorectal examination did not indicate sigmoidoscopy. We were consulted because of pilonidal cyst diseases, external thrombotic hemorrhoids, para-anal abscesses, pruritus ani, fissures, cryptopapillitis or prolapsing hemorrhoids. The patients who had any history of bleeding or of bowel habit change or who had any pain in the lower left quadrant were not included in this series.

Of these patients, there were fifty-five who had adenomas, four of these fifty-five showed only a minimal amount of malignant change. The other cases were entirely benign and offered no problem as to management.

Therefore, in conclusion, I can only state that Dr. Young's paper brings out the importance of complete rectal examination, even in the absence of any history of anorectal disease; and, also, in our crusade in cancer detection and cancer cure although it is much more interesting scientifically to discuss series of cases of rectosigmoid carcinoma and their response to the various types of surgery, I believe we are doing our patients a much greater service, a more humane service, by the early diagnosis and removal of the asymptomatic adenomas.

Russell R. Klein (San Francisco, Calif.): Drs. Tenner and Christianson and Dr. Young are to be congratulated on their two excellent and comprehensive papers. I appreciate this opportunity to discuss them. In both papers the authors have found that in about 10 per cent of so-called normal adults adenomatous polyps are present in the rectum or lower sigmoid. Their work confirms the reports of previous sources or investigators.

Of even greater significance is the number of adenocarcinomas found in adults without symptoms referable to the rectum or colon. Drs. Tenner and Christianson report one carcinoma found for every 600 well people examined. Dr. Young reports one carcinoma for every 100 well people examined. These figures are most interesting and one wonders what the experience of others has been.

The present status of so-called cancer detection centers in the fight against cancer is a controversial one. Certainly some good has come out of such centers as the one about which we have just heard. This particular center is actually dealing in clinical research and, presumably, is exceptionally well staffed with professional men interested in the special fields.

The problem is whether the results obtained by this method justify the expenditure of time and money or whether some other plan would prove more effective in the early diagnosis of cancer. According to the latest bulletin of the American Cancer Society reporting on one-half of the nation's 210 cancer detection centers, one cancer of the rectum was found for every 2,000 well people examined. This figure represents what the average center is actually finding in its cancer detection work, at a reported cost varying between $5,000 and $20,000 for each case detected.

This low incidence is discouraging and is due to a number of factors such as inexperience on the part of the general man who staffs the average center and the lack of uniformity in the minimal standards of examination. For example, in only

one-third of the centers is proctoscopy done routinely. In California the principle of cancer detection centers has been abandoned in favor of measures thought to be more productive in detecting early cancer. This, primarily, is the plan of making every doctor's office a cancer detection center. The plan stresses the examination of accessible sites with their more favorable chance of early diagnosis and permanent cure. The rectum is in this group.

During the past year the entire professional educational program on cancer in the state of California has been carried out on a budget equal to the cost of detecting a half dozen cases by the detection center method. Granted that it might be desirable to give a thorough medical examination to every American citizen once or twice a year, the actual number of physicians now available or likely to be available in the near future would make such a program virtually impossible. For example, 195,000 physicians working full time would be required to give a one-hour examination to every citizen twice a year. We cannot expect the average physician to proctoscope all his patients without symptoms when there is an appalling lack of this examination in patients whose symptoms demand it.

In conclusion, it would seem to me that the policy of this Society should be to encourage through education and example a better examination of the rectum when symptoms are actually present, rather than to advocate routine examination in so-called normal people.

COMPLICATIONS OF ANORECTAL SURGERY

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THE common complications of anorectal surgery have received little attention in textbooks and other publications. Some surgeons are reluctant to admit the minor complications which can be so distressing to the patient as well as to the proctologist. The most common complications are: (1) postoperative pain, (2) immediate hemorrhage, (3) delayed hemorrhage, (4) edematous anal tags, (5) delayed healing of wounds in the anal canal and (6) anal stenosis.

A certain amount of pain cannot be avoided, but excessive pain may be modified in several different ways. The sphincter muscle, the deep layer as well as the superficial layer which is adherent to the skin, must be gently handled. Hemostats should not be placed on any of these muscle fibers. Almost all bleeding vessels in the muscle will retract with pressure in a short time. Ties should be used sparingly and definitely not put on fibers of the muscle. Clamps put on any bleeders during the operation should be removed at the finish when few vessels will be found still bleeding. A tie may be used on a very small amount of tissue if bleeding is persistent. In most of my operations I use none.

In our experience we have had little success with oil-soluble anesthetics injected into the muscle. Perhaps our technic was not proper, but we found these patients needing just as many postoperative hypodermics as those in whom we did not use oil. Spinal anesthesia using nupercaine,* 2.5 mg. in 5 per cent dextrose solution, with the addition of three to four drops of adrenalin will provide prolonged saddle anesthesia when given with the patient in a sitting position. This anesthetic has been used to date in over 150 cases with no complications. No headaches resulted which needed special medication. The anesthesia has been satisfactory even when surgery has lasted longer than one hour. The patients have been able to move around in bed on return from surgery but have had no pain sense for from four to twelve hours after injection. This enables the patient to feel better and to eat solid food two to three hours after surgery. It also reduces the need for narcotics. Our patients receive an average of two hypodermics of morphine sulfate, ¼ gr., during the first twenty-four hours following operations. Few ever use more and many have none or one.

A patient seldom complains of sphincter spasm as a result of the aforementioned procedures. The subcutaneous portion of the external sphincter is divided one-half way through routinely in all cases of fissure and spastic sphincter. This of course should not be done in patients with hypotonic sphincters or with rectal prolapse or procidentia.

After the first postoperative dressing I use hot sitz baths and surfacaine ointment* freely; these greatly increase the comfort of the patient.

Hemorrhage may occur in the first twenty-four hours following operation due to the slipping of a tie on one of the hemorrhoidal veins or the breaking loose of a clot in an untied artery or vein where the packing does not create adequate pressure. This is usually initiated by vomiting, coughing or too rapid movements of the patient. The bleeding may be profuse, without warning. The patient may be found lying in a pool of blood or the hemorrhage may manifest itself by an intense desire to defecate in which the patient expels packing, drain and all.

When such a hemorrhage occurs, all dressings should be removed, the raw areas cleansed well with peroxide and a careful external examination made. If the bleeding vessel is superficial, a clamp can be put on for a few minutes and the bleeding stopped. With oxycel gauze used as packing, these superficial bleeders are rare. If no bleeders are seen externally, the patient should be returned to surgery immediately, given an intravenous anesthetic and the bleeder found and ligated. There should be no delay while attempting to use antihemorrhagic drugs to control bleeding. Blood transfusions may be needed after the bleeder is tied.

Late hemorrhage is more difficult to control. This usually occurs seven to fourteen days fol-

* Ciba Pharmaceutical Products, Inc., Summit, N. J.

* Eli Lilly & Co., Indianapolis, Ind.

lowing operation. Since my patients are usually sent home in six to seven days, this occurs usually at home. It is more common in very elderly persons or those who are anemic or debilitated.

Late hemorrhage is caused either by absorption of the ligature on a vein or the pulling off of the ligature by a hard fecal mass where the vein has not formed a solid clot with closure of the lumen. Packing these areas is not satisfactory. The patient should be returned to the hospital, taken to surgery and the bleeder found and tied. I have used all types of sutures from No. 00 plain catgut to chromic No. 2 and find that the suture makes little difference. I routinely use chromic No. 1, single and have never had a patient return with a second hemorrhage. In these cases, also, a blood transfusion usually aids in convalescence and improves the morale of the patient and his family.

In 200 consecutive hemorrhoidectomies I have had three superficial hemorrhages which necessitated removal of the oxycel gauze, thorough cleansing with hydrogen peroxide, repacking with oxycel gauze and application of a firm pressure dressing. In all of these there was no subsequent excessive bleeding.

In the same group there were four patients with rectal hemorrhages. One occurred eight hours after surgery expelling all packing and drain. One occurred on the seventh postoperative day, one on the twelfth and one on the sixteenth. These four patients were all returned to the operating room where the bleeding vessels were ligated.

Edematous anal tags form usually five to ten days following operation. They are caused by inadequate drainage of the anal wounds which allows collection of exudate under the skin bridges and produces edema. The bridges become swollen, from 3 to 10 mm. in size, and are red, hard and painful. The patient will notice the tender tag on sitting and also while cleansing himself. These tags may be prevented by not undercutting skin bridges so completely. However, it is more important to undercut these bridges and excise the entire plexus of external hemorrhoidal veins even at the cost of a few tags than to leave these veins as sites for possible future thrombosis. By carefully saucerizing the skin edges and pointing the end of the wound, sufficient drainage may be obtained to minimize the incidence of postoperative tags. Since these usually occur after the patient leaves the hospital, they are excised in the office on his first or second check-up. This can easily be done under local anesthesia. If allowed to remain they will gradually subside but will always remain as folds or tags which might initiate a future pruritus ani. During the removal of these tags a large enough area must be excised to obtain adequate drainage or the same condition may recur.

Slow healing of the anoderm high in the anal canal is seen frequently in the postoperative period and is practically always due to inadequate skin drainage. It occurs most commonly in very obese individuals. Many patients have been seen two to three years after surgery with high anal ulcers or low rectal ulcers due to improper postoperative care.

In my own cases the skin areas often heal beautifully but the modified skin of the anal canal remains open. If not given proper care they never will heal.

During the postoperative care the anoderm should not be allowed to heal before the mucosal surfaces. I treat the distal margins of the raw areas in the skin weekly, with 10 per cent nitric acid in order to retard healing. At the same time I treat the proximal raw areas with 10 per cent silver nitrate to stimulate granulation tissue. If in spite of this the skin heals first, I excise an area of skin almost as large as the original wound under local anesthesia in order to get proper drainage. This procedure is most important in order to get complete healing.

Occasionally, overlooked small anal papillae will enlarge during the early postoperative period. Sometimes the area of ligation of the hemorrhoidal vein will develop a polypoid growth. The edges of the mucosal wounds may sometimes become edematous and swollen. Before dismissal the patient should be given a thorough examination both with finger and proctoscope. If any of these lesions is found, it should be corrected under local anesthesia.

Anal stenosis is perhaps the most common complication of anorectal surgery. The technic of surgery and postoperative care is planned with the thought or fear of future stenosis. The avoidance of this condition begins with surgery. Leaving an adequate amount of anoderm, leaving as wide skin bridges as possible and incising the external sphincter muscle all help. By the fourth postoperative day I begin rectal dilations, continuing them every three to seven days depending on the tightness of the canal until the healing is complete. I do not allow

my patients to do their own dilations, nor do I use mechanical dilators.

After the first five to six days I reduce or discontinue all laxatives in order that the patient may have firm bowel movements. I do not use mucilaginous drugs to retain fluid in the intestinal canal. I want my patient to have solid stools even though he may have to strain to deliver them. I warn my patient to expect to strain and to have pain and even some bleeding with his movements if healing is to progress in the normal way. In this way he gets his own daily dilations on which I improve with my own examination every few days.

Dilation may be painful to the patient. I use 5 per cent metycaine in the anal canal previous to my examinations. When the patient understands the importance of the dilation, he is usually very cooperative.

Once in a long while a short band of scar tissue may form in the low rectal mucosa which I do not hesitate to incise early. A similar circular band of scar tissue may form at the intersphincteric line which should also be incised. Allowed to remain, these will narrow the lumen of the canal considerably.

Urinary retention, rectal impaction and other minor complications are not considered in this paper. These are usually easily controlled. By putting my patients on a regular diet and allowing them to be up as much as they wish on the first postoperative day I seldom have difficulty with these conditions. Early activity and full diet aid in obtaining early bowel elimination and also speed the patient's release from the hospital.

SUMMARY

The prophylaxis and treatment of six frequent and important complications of anorectal surgery are discussed. Included in this discussion are postoperative pain, hemorrhage, edematous anal tags, delayed healing and anal stenosis.

CONTROL OF HEMORRHAGE FOLLOWING ANORECTAL SURGERY

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RECTAL bleeding seems of little importance until we are confronted with a massive postoperative hemorrhage in the early hours of the morning. This paper will describe a simple and effective method of control of those hemorrhages which constitute a serious emergency. Slight anal bleeding and blood-stained stools following surgery will not be discussed.

Many textbooks published within the last fifteen years dismiss the subject of postoperative hemorrhage in a short paragraph with recommendations to grasp and ligate the bleeder or to pack the rectum with gauze. Gant[1] describes several methods. One consists of packing the rectum with gauze to which two stirngs have been attached and tying them to an external pack. In another method gauze is packed into a tent previously placed in the rectum. Yeomans[2] described a similar method but spiraled the cord around the gauze. Gabriel[3] describes a pack consisting of a hollow tube around which dry gauze has been wrapped. Buie[4] describes a method which will be described with minor modifications. Dr. Buie credits this method to Drs. E. C. and F. W. Burrows.

Before describing this method let us briefly review the symptoms and causes of postoperative hemorrhage. The symptoms of massive rectal hemorrhage are the local manifestations plus the classical symptoms of concealed hemorrhage anywhere in the body, i.e., as in general shock, faintness, sweating, pallor, air hunger and a rapid, thready pulse. The local symptoms are an urgent desire to defecate and a serosanguineous discharge from the rectum. The patient usually gives a history of a desire to defecate followed with the passage of a large amount of blood and dizziness or syncope. Upon examination the buttocks will be found soiled with fresh and clotted blood. When a rectal speculum is inserted, there will be a flow of blood resembling a miscarriage.

Primary postoperative rectal hemorrhages, those occurring soon after surgery, are usually due to faulty operative technic such as insecure ligation of the pedicle with hemorrhage from the superior hemorrhoidal vessel. Secondary postoperative hemorrhages, those occurring on or about the tenth day postoperatively, are usually due to infection or to ligation of too thick a pedicle.

The following cases will illustrate some of the common causes of postoperative hemorrhage:

CASE REPORTS

CASE I. F. L., a female aged thirty-three, was operated upon April 21, 1945, for internal and external hemorrhoids by the suture over clamp method. She was dismissed from the hospital on April 25th after an uneventful recovery. About midnight, April 30th, her mother called stating that the patient had fainted while on the toilet after passing a large amount of blood. The patient was sent to the hospital at once. Rectal examination revealed a thick, greyish stump at the site of the upper pole of the right posterior hemorrhoid. The stump was bleeding but showed no evidence of a spurting vessel. The rectum was packed in the manner to be described later. The pack was removed after fifty-two hours. Recovery was uneventful.

CASE II. W. J. a male aged forty-one, was first seen in the office on October 20, 1947. He had large internal hemorrhoids which bled with stools and prolapsed upon straining. Surgery was advised but the patient chose injections. The left lateral hemorrhoid was injected with 6 cc. of 5 per cent phenol-in-oil. The same afternoon the patient requested surgery. He entered the hospital and was operated upon the following morning, using the dissection and ligation method. At the time of operation the injected hemorrhoid was inflamed and indurated which made it impossible to dissect the hemorrhoid to a narrow pedicle. The patient left the hospital on the fourth postoperative day. On October 28th he came to the office complaining of a sense of fullness and warmth in the rectum. Digital examination revealed an indurated mass that was hot to the touch at the site of the stump of the left lateral hemorrhoid. On the ninth day postoperatively the patient entered the hospital following a severe rectal hemorrhage. Rectal examination revealed that the sloughing, greyish stump of the left lateral hemorrhoid was bleeding

profusely. The stump was sutured but the suture cut through the inflamed tissue. The rectum was packed with gauze which was removed after forty-eight hours. Recovery was uneventful.

This case is cited to call attention to the fact that injection of the hemorrhoid creates in-

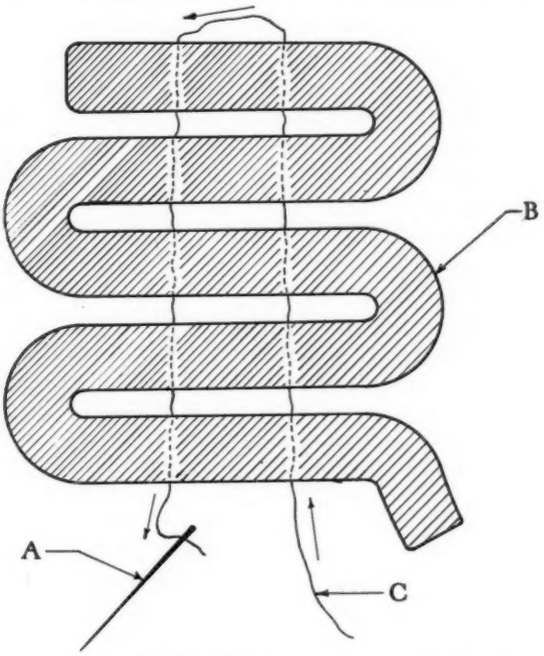

FIG. 1. A, straight needle; B, gauze pack folded to 2-inch squares; C, heavy linen suture.

duration and inflammation of the area which contraindicate surgery. Operative procedures should be postponed until all induration and inflammation has subsided, which is usually about three weeks.

It should be realized at this point that each case of rectal hemorrhage, if treated at all, should be considered serious or potentially serious. No half measures should be permitted. It is far better to do too much than too little.

A suggested routine is as follows: Nurses and house physicians should be instructed as to the symptoms. Patients being dismissed from the hospital should be instructed to report any excessive amount of blood noticed in the stools. If the physician cannot be reached, the patient should return to the hospital at once. When hemorrhage is diagnosed, the patient is put to bed and ¼ gr. of morphine is given. The physician is notified. The patient is typed for blood transfusion and is then sent to the dressing room.

For treatment the following equipment is needed: a strong suction apparatus, one bivalve or medium-sized tubular speculum, a few small surgical sponges and a rectal pack. The rectal pack should be made in the following manner: Beginning at one end one-half of an ordinary vaginal pack is folded back and forth

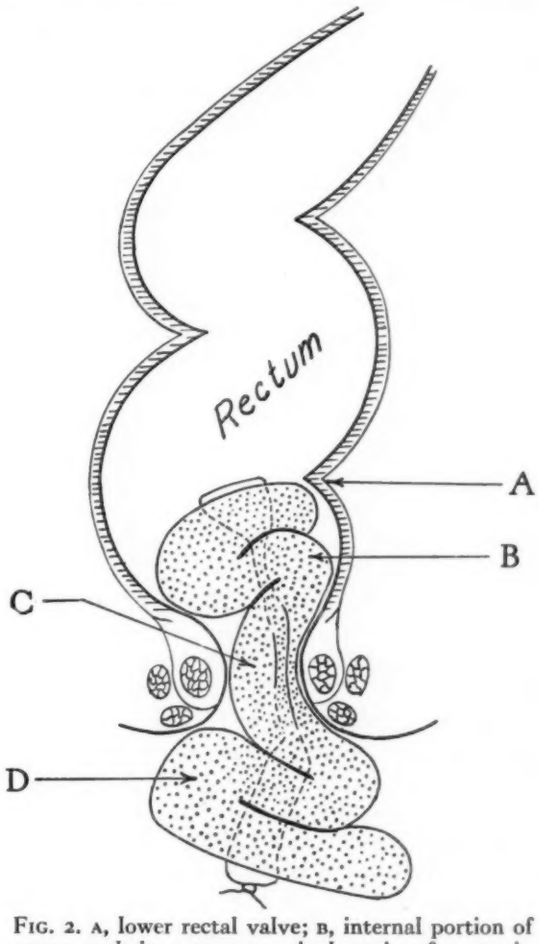

FIG. 2. A, lower rectal valve; B, internal portion of gauze pack in rectum; C, single strip of gauze in anal canal; D, external portion of gauze pack against the anal margin.

on itself in an accordion-like fashion so that it forms a pile about 2 inches square. This vaginal pack is made of absorbent gauze 3 yards long and 1 yard wide folded to make a pack 2 inches wide and 3 yards long. Surgical supply houses supply this in 5-yard sterilized packages folded to 4½ inches in width. A 3-foot strip of this may be folded once lengthwise making a very satisfactory pack.

After the gauze has been folded, a large straight needle is threaded with a heavy linen retention suture about 5 feet long. This suture is passed through the pack and then passed

back in the opposite direction, returning the suture to the starting point. The loose ends are tied together to prevent unthreading of the pack. (Fig. 1.)

With the preceding equipment at hand the patient is placed in the lithotomy position. At this point it is important to note that if an anesthetic is used it should be carried as lightly as possible. An anesthetic is usually unnecessary. The anal canal is first gently dilated manually and the speculum is inserted. Suction is used to clean the rectum and irrigation with a warm saline solution may be used if necessary. If an actively bleeding vessel can be seen, it may be sutured; but too much time should not be wasted in searching. The surgeon should not depend on the ligation of the bleeder to control the hemorrhage. Very often the ligature will erode through the tissue and a repetition of the hemorrhage will occur.

After the rectum has been cleaned, the pack is inserted. This is done by threading the pack through the speculum, placing the gauze as far up as possible without undue force. When the rectum is filled, the speculum is removed while the pack is held in place with the forceps. The external part of the pack is then pushed against the anal margin with one hand while the other hand pulls on the free ends of the suture. When the tension is snug, the suture is tied. This creates a dumbbell-shaped pack. The inner sphere of the dumbbell exerts a firm pressure on the lower part of the rectum and the upper part of the anal canal. The outer sphere exerts firm pressure on the external margin. The handle of the dumbbell lies in the anal canal. Since there is only one strip of gauze in the anal canal, the pack causes very little discomfort. (Fig. 2.)

After the pack is in place a blood transfusion is started as soon as possible, the amount depending on the condition of the patient. A soft diet with low residue is allowed. Mineral oil is given morning and night. Opiates are allowed for pain if needed although the discomfort is not as great as that following anorectal surgery. The pack is removed after forty-eight hours. It is advisable to give 1/6 gr. of morphine one-half hour before removal. The pack will be found saturated with serum and removal is not as painful as one might expect. If the bowels have not moved within twenty-four hours after the pack has been removed, an oil enema should be given followed with a saline enema if necessary.

Attention should be called to the fact that this method is applicable only to those hemorrhages having their origin in the lower portion of the rectum, i.e., those below the lower rectal valve. This pack applied for hemorrhages above this area would act as an anal plug concealing the severity of the bleeding which could lead to fatal termination.

SUMMARY

1. Attention is called to the potential severity of postoperative anorectal hemorrhages.
2. The diagnosis and causes are briefly noted.
3. A simple and effective method of control is described in detail.
4. Contraindications of the method described is noted.

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TWO NEW METHODS FOR REDUCING DISCOMFORT AFTER HEMORRHOIDECTOMY

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A CONVERSATION some years ago with an elderly family physician influenced us to start using a new postoperative procedure which has added greatly to the comfort of our patients. This physician, the late Dr. Francis A. Hargrave of Ionia County, Michigan, related his observations of many years' experience in the removal of malignant and non-malignant skin lesions. After removing these skin tumors under local anesthesia he applied nitric acid to the exposed area. He believed that nitric acid used in this way stimulated wound-healing with a minimum of smooth scar formation which was not achieved by the use of other acids, the actual cautery or electric desiccation.

Our own experience with nitric acid used in this manner convinced us of its real value. Several early perianal epitheliomas were treated with wide excision followed with cauterization of the exposed area with nitric acid. The excellent anesthesia obtained and the superior healing of these wounds prompted us to use nitric acid on the skin edges of several large fistulectomy wounds, which responded with equally gratifying results.

At first this nitric acid technic was used only in operations for fistula, but its successful use in these cases indicated that its application would also prove valuable on the outer skin edges after hemorrhoidectomy.

Since cautiously using nitric acid on the first few patients three and a half years ago we have adopted it for routine use after each hemorrhoidectomy. Full strength nitric acid is lightly brushed on the skin edges with a firm cotton applicator from which excessive amounts of the acid have been removed by blotting on gauze. Extreme caution must be taken to prevent the acid from coming in contact with the muscle.

The use of this technic has not only prevented much postoperative pain but has also checked too rapid healing of the outer part of the wounds and has thus encouraged satisfactory drainage. At no time has more tissue destruction occurred than was desired. However, it is evident that injudicious use of nitric acid could easily cause destruction of too much skin and muscle.

Another method of adding to the postoperative comfort of the patient is the use of a small retention enema containing bulk laxative given to stimulate delayed bowel evacuation. The more commonly used oil retention enema or other types of enemas or cathartics seem to soften the stool so much that its full value is lost and the patient still has to wait in dread for his first spontaneous evacuation. Four or five drams of bulk laxative are quickly mixed in a few ounces of tap water and instilled in the rectum, using a large asepto syringe and a wet No. 22 French catheter. The material is retained and soon becomes partly solidified, usually resulting in a normal evacuation within a few minutes to a few hours. The soft gelatinous mass precedes the more solid fecal mass and less than the usual discomfort is experienced. If only that material which has been introduced is expelled, it usually means that the column of fecal matter has not yet reached the lower bowel and the procedure can be repeated a half day or a day later with the desired result.

It is usually necessary to demonstrate the use of this technic to the nurse or she will not mix and instill the ingredients rapidly enough and solidification will occur in the syringe and catheter.

A few other factors in securing postoperative comfort seem important enough to re-emphasize although they are widely practiced. If a large amount of coagulant material is left in the anal canal after hemorrhoidectomy, severe muscle spasm usually results. The use of small amounts of these materials crumbled into a fine powder are less irritating and are probably just as effective.

Postoperative gas pains can usually be prevented by attention to the following principles: (1) avoidance of any type of postoperative anal plug; (2) the use of a small water enema the

night before surgery instead of more irritating enemas and the avoidance of enemas the day of operation; (3) the placing of a piece of gauze in the rectum at the beginning of the operation to prevent blood from running into the sigmoid, the gauze being removed at the end of the procedure.

One of the most important factors in securing comfort following hemorrhoidectomy is the reduction of fear and apprehension in the patient. This is sometimes accomplished unconsciously by the surgeon by the transference to the patient of his own faith in some method he employs. It is also frequently possible to overcome the fear and apprehension of even a very tense patient by the explanation that the pain is caused largely by muscle spasm. A few minutes spent in teaching the patient some fundamental relaxing exercises often pays big dividends and will be welcomed by the patient. Also, if he is actively trying to do something to help himself, fear and apprehension tend to become dissipated.

Dread of the first bowel evacuation often causes a patient to resist the normal physiologic action so greatly that spasm of the sphincter and associated muscles occurs. If this fear has been reduced by an adequate explanation of what is expected of the patient and by instructions in general muscular relaxation, the discomfort of the first evacuation will be minimized.

SUMMARY

Two new procedures are suggested for help to reduce pain following hemorrhoidectomy. Nitric acid is applied to postoperative wound edges. Bulk laxative enemas are used to stimulate bowel evacuation.

Several other suggestions for reducing postoperative pain are made.

PRE- AND POSTOPERATIVE CARE IN ANORECTAL SURGERY

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TECHNICS in anorectal surgery have been more or less standardized by the members of this Society, but pre- and postoperative procedures vary greatly. The belief that refinements in this field could reduce pain, provide smoother and shorter convalescence and lower costs to the patient led us to circularize questionnaires to the 440 members of the American Proctologic Society.

This report is a complete review of statistics based upon a 72 per cent return from those questionnaires and is being made to acquaint us with the collective opinion of the group.

PREOPERATIVE CARE

Most hospitals require a minimum of laboratory work such as that required for all preoperative cases by the American College of Surgeons; and inasmuch as most anorectal surgery should be performed in hospitals, the tabulations revealed only a few major variations from this pattern.

Only 70 per cent of the returns indicated that a serologic test for syphilis was routinely carried out, which indicates that 30 per cent of the members of the Society do not seek to rule out syphilis as an etiologic factor or complication. Ninety per cent indicated that red blood cell, white blood cell and hemoglobin estimations were made.

Regarding a blood smear 53 per cent replied that this procedure was not done routinely. When we consider that the anemia present with malignancy of the right colon is often of the macrocytic type and simple bleeding from the lower colon results in hypochromia of the blood cells, it would seem that the smear is a valuable asset and should be made a part of our routine laboratory study.

Bleeding and clotting studies were done by approximately 40 per cent, but some stated they did them only if indicated. If only one patient in several hundred is found to have a bleeding tendency or a deficiency in the clotting mechanism, it appears these studies are worth while. Therefore, the blood smear and bleeding and clotting time are recommended to be placed in the standing orders for laboratory work in anorectal cases.

Seventy per cent of the members favored perianal shaving and 30 per cent of them were definitely against it. By carrying out this procedure it is believed the surgeon preserves his moral convictions of surgical technic and avoids embarrassment when his work shifts from the more or less contaminated anal area to the abdominal cavity. It is a basic surgical tradition that hair in and about surgical wounds predisposes to sepsis and contamination. The authors agree with the majority and favor shaving of hair in and around any operative area. It is acknowledged that regenerating hair does to some degree cause itching, and in certain nervous and emotional patients this itching might, theoretically, promote or aggravate pruritus. However, we have seen no such cases, while many are relieved by the definitive surgery and all are benefited by the ultrascrupulous hygiene afforded by shaving.

Twenty per cent recorded that they use antibiotics and chemotherapeutic agents preoperatively, and sulfathalidine is mentioned specifically by five, one-fourth of that group. It is obvious that use of the non-absorbable sulfa drugs, penicillin and streptomycin is widespread in surgery of the colon. However, in anorectal surgery we agree again with the majority in that nothing seems to be added by their administration.

Soporific drugs are given the night before surgery by approximately 90 per cent of the members. The shorter-acting barbiturates are favored in this connection, but there were occasional reports of the use of the longer-acting barbiturates and other mixed proprietary drugs. It is believed that most patients suffering with anorectal diseases are more nervous than the average, and these drugs lessen their apprehension and promote restful sleep the night before surgery.

An enema was given by 86 per cent the night before surgery, but on the question of repeating it the morning of surgery there was marked disagreement. Only 40 per cent repeated the

enema in the morning and 60 per cent were against it. Materials used in these enemas were in the majority of cases tap water, saline or soda. A few still cling to the use of the soapsuds enema, but the majority disapprove of soapsuds and are aware that besides being a poor

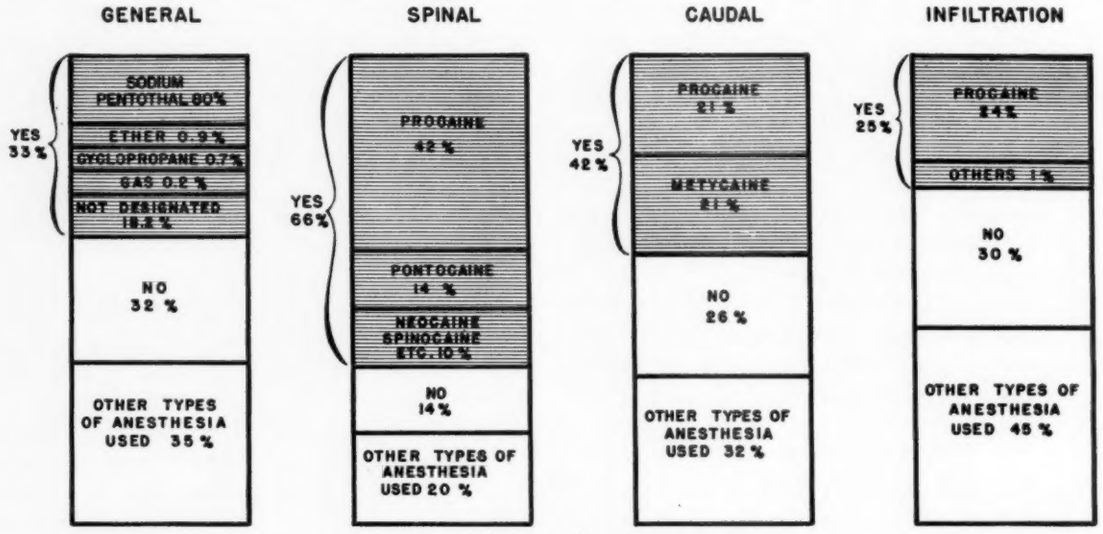

FIG. 1. Anesthesia used in anorectal cases.

solvent of mucus it is also a definite irritant. An occasional surgeon orders petrogalar or milk and molasses for a preoperative enema. It would be most interesting to learn the reasons a small group of proctologists have for not giving *any* enema previous to surgery. It seems reasonable that an empty colon would be much more comfortable than one which started emptying into the freshly operated wounds shortly after surgery.

Immediate preoperative narcotics were used by 95 per cent, the large majority preferring morphine sulfate and a smaller percentage demerol or pantopon. Occasionally other products were used. Soporific drugs were used by approximately 76 per cent, with the shorter-acting barbiturates again being the favorite. Atropine-like drugs were used by approximately 70 per cent, scopolamine and atropine being almost equally divided in this classification. Undoubtedly the choice of these preoperative medications is influenced by the type of anesthesia to be given.

The choice of anesthetic agent is chiefly dictated by the patient's emotional make-up, age of the patient and the presence or absence of infection. (Fig. 1.) In this review 33 per cent indicated that general anesthetics were used although it was not specified that these were used exclusively. Pentothal sodium® or pentothal® and gas were the most common. Spinal anesthetics were used by 66 per cent with procaine the most frequently used agent. Pontocaine was used by approximately 13 per cent of those using spinal anesthetics. Transsacral approaches were used by three and the perisacral approach was reported by one surgeon. The so-called "saddle block," which is a very low spinal and involves only the lower segment, is undoubtedly used widely although this was not commented upon by many of those physicians submitting returns. It has been our experience that the low dosage, low spinal or saddle block anesthetic has the least deleterious effect on the patient and affords perfect relaxation of the anal sphincters. Caudal anesthetics were used by 42 per cent with metycaine and procaine being divided about equally for this purpose. Infiltration anesthetics were reported used by 25 per cent, with procaine being the usual agent. One indicated that nupercaine in water 1:1000 was the drug of choice.

The larger part of the group, 81 per cent, apparently does not believe antibiotics or chemotherapeutic agents are helpful or necessary at the conclusion of surgery. Those who did use them mentioned sulfathiazole powder or an ointment with some sulfa component.

Drugs for prolonged anesthesia were reported used by 43 per cent, with the following proprietary agents listed most often: zylcaine,® anusol, diothane and eucupin. Several com-

ments regarding discontinuation of these agents were made, usually with reference to abscess formation as the cause for avoiding them.

Hemostatic dressing were used by 32 per cent, with oxycel gauze being indicated in the majority of cases. Our experience has been more favorable with pressure dressings with moderate tension applied as a pyramid of rolls of gauze. This is mentioned by others also, and the use of this dressing obviates the use of absorbable hemostatic dressings as reported by 74 per cent of the forms returned. At times a collection of exudate has been found in oxycel which is odorous and unpleasant to the patient and the surgeon. This inconvenience is small, however, if the case indicates a real necessity for control of oozing.

Drains were reportedly used in the anal canal in 45 per cent of the returns, with preference for Penrose drains or rubber tissue strips. Apparently the older practice of using large, firm "flatus tubes" has fallen into deserved disrepute since it was mentioned by only one physician contributing to this study. The Penrose drain avoids agglutination of wounds and allows gas to escape.

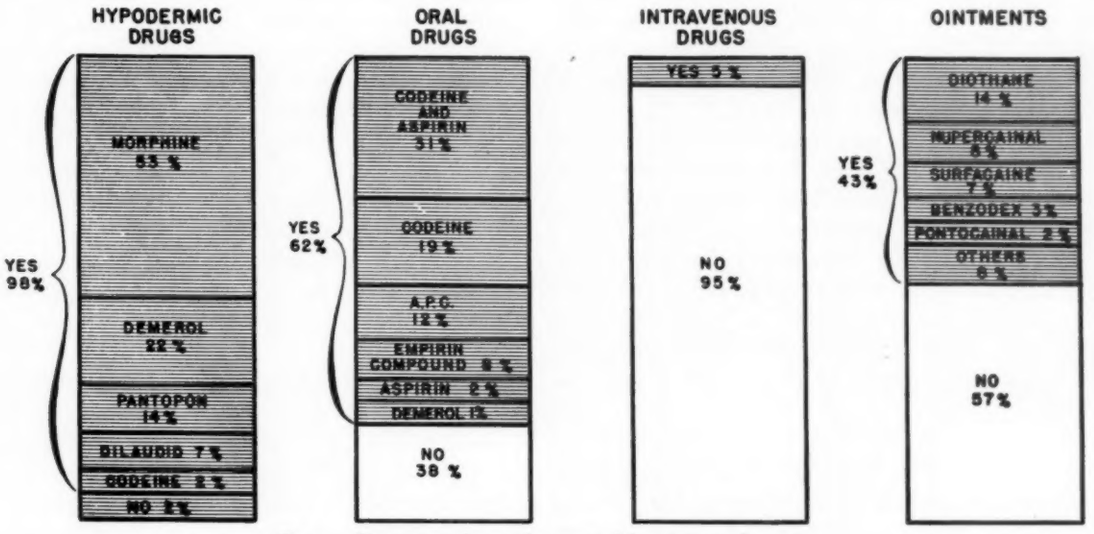

FIG. 2. Postoperative pain control in anorectal cases.

POSTOPERATIVE CARE

Pain control was accomplished by the use of the stronger narcotics. Morphine was the popular choice as 53 per cent reported its use while 22 per cent preferred demerol and 14 per cent pantopon. Dilaudid was used by 7 per cent. Newer substitutes for morphine were conspicuously absent in the replies. (Fig. 2.)

Anesthetic ointments were used by 43 per cent in the following order: diothane, 14 per cent; nupercainal, 8 per cent; surfacaine, 7 per cent; benzodex, 3 per cent; pontocaine, 2 per cent; others, 8 per cent.

Of the oral medications, it was indicated that 62 per cent used them; the favorite agent was aspirin, usually with codeine.

Procaine, 0.2 per cent was used intravenously by the authors in a small group of cases with the desire to reduce the amount of narcotic used to relieve postoperative pain and to eliminate the necessity of catheterization. Our results were radically disappointing as neither of those goals were attained. However, we recognize the possibility that when larger concentrations have been used or variations in the amount of the glucose or saline vehicles are made more gratifying results may be obtained. The overwhelming desire of the profession to produce freedom from pain should stimulate cautious research into this method of medication. Only 5 per cent of the returns indicated the physicians had used intravenous solutions to control pain.

Hot compresses were reported used by 60 per cent, usually on the first postoperative day. In defense of the hot compresses, they become most useful when surgery has been performed during catamenia or when the patient is weak and unable to use the sitz bath. This method is also particularly applicable in those

edematous cases in which immediate application of moist heat is desired and the anesthetist may have requested that the patient's head be kept low.

The agreement on sitz baths was almost complete. More than 96 per cent indicated that they use this effective method of alleviating discomfort and promoting healing. Most often these were started on the second postoperative day although occasionally sooner.

Catheterization was ordered as a routine measure by 16 per cent. Fifty-seven per cent favored catheterization only when necessary. Estimation of the proportion of patients requiring it varied widely. Some thought that 5 per cent or less would need it while a few believed that over 90 per cent would be unable to void naturally. The majority of the replies, however, indicated that from 10 to 30 per cent would require it.

In a series of 100 recent anorectal cases we were astonished to find that 66 per cent of the patients required catheterization at least once, 20 per cent were catheterized two times and 9 per cent three times or more when there was no existing genitourinary pathologic condition. These results were present regardless of the type of anesthetic agent or the method of its administration. It is understandable that such variations in the reports would occur since some surgeons do not object to catheterization while others believe there is great danger of infection of the bladder by this procedure. Our consultants in urology believe that a distended bladder is fertile soil for infection and, therefore, we favor catheterization when the bladder is distended and the patient unable to void, preferring not to overdistend the bladder. By following this procedure only a very occasional patient has a temperature rise over one degree postoperatively so we believe that this has been fairly satisfactory. However, one of the purposes of this study was to determine if possible a means whereby catheterization could be avoided, and the attempt at using intravenous procaine was employed with this in mind. Other methods have been used such as the injection of recently developed antispasmodic drugs, but none have been uniformly successful.

It is apparent that the majority opinion calls for a liquid diet only on the day of surgery although a low residue, soft or even a general diet is made available on that day by 40 per cent of the physicians questioned. On the first postoperative day a general diet is most frequently indicated and a soft diet is employed by 23 per cent. The fourth postoperative day and thereafter the majority of opinions call for a general diet. A low fiber diet which we use is indicated by a moderate percentage. It is believed that by removal of the vegetable fibers almost a full diet can be gained thereby with sufficient bulk to produce fairly early bowel movement by this means. The tendency which seems to be evident is toward a general diet or a slightly modified general diet early after anorectal procedures, thus attempting to restore normal physiology as soon as possible and cut down hospital time. It is assumed that all strong condiments (nuts, pickles, etc.) are uniformly omitted from the diet until the wounds are healed.

Postoperative enemas are ordered routinely by 33 per cent, and 33 per cent are ordered "when necessary." Most frequently used are oil and tap water enemas although saline is used by a moderate percentage and occasionally such mixtures as mineral oil and glycerin, petrogalar, or saline and peroxide are used. Significantly only five papers reported use of the soapsuds enema postoperatively. (Fig. 3.)

Cathartics were ordered routinely by 46 per cent. The most frequently ordered was mineral oil, secondly milk of magnesia, and a variety of others including Fleets phosphosoda, compound licorice powder, petrogalar, agarol and zymenol were noted in decreasing frequency. Infrequently mentioned were cascara, pluto water, castor oil, siblin, magnesium sulfate, sodium phosphate, metamucil, theolin and hydrocil.

If one agrees that the average healthy person has at least one bowel movement each day, a non-irritating cathartic should be administered in those postoperative cases in which this does not occur. The hydrophyllic drugs are excellent for this purpose since by their bulk they assist in dilating the sphincter gently and thereby restore normal physiology.

Digital examinations were indicated as used by 73 per cent. Some surgeons stated that digital examinations were not made at all. Others waited until the fifth or seventh day. A glass probe was mentioned in two reports. This seems to have little advantage over the readily available gloved finger and may have some disadvantage in not containing sensory nerves for testing the adequacy of the anal canal.

Especially in ligation-dissection hemorrhoidectomies in which all wounds are carried well out on the skin and left open for drainage, the digital examination not only reduces spasm but also prevents agglutination of one open surface to another. Therefore, we favor early digital examination preferring not to let the surfaces agglutinate for several days before they are separated.

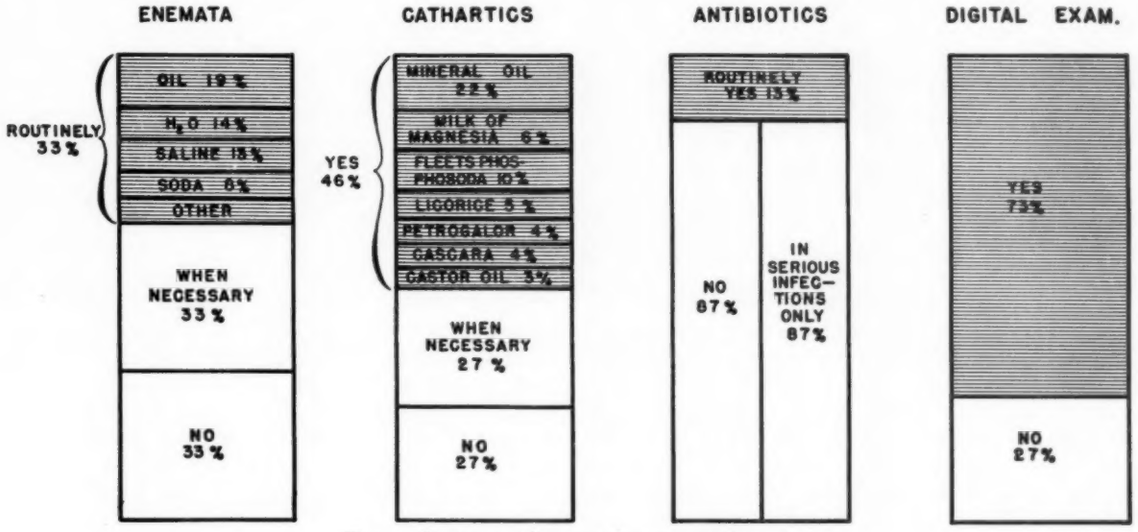

FIG. 3. Postoperative care in anorectal cases.

The usual day of ambulation following hemorrhoidectomy was reported the first or second postoperative day. Approximately 10 per cent allow patients to ambulate the day of surgery. Infrequently the patient is kept in bed until the seventh day. The day of returning to work varied with the type of work which the patient performed. The majority indicated that most patients do so between the tenth and eighteenth days. A few reported patients able to work by the seventh postoperative day, while as few physicians believed that an occasional patient would be incapacitated for a month.

DISCUSSION OF PAPERS BY DRS. PEARSON, ROLENS, HART, AND JOHNSON AND SCHILLA

CHARLES E. POPE (Evanston, Ill.): It is a pleasure to discuss four papers which together form such an excellent symposium on the pre- and postoperative care in anorectal surgery.

The first three papers by Drs. Pearson, Rolens and Hart, respectively, shall hold our first consideration. On many points of general management as outlined I am in agreement, but in quite a few details I am not wholly in accord.

Hemorrhage requires immediate control by pressure pack externally if it is from without or by such as an accordion pack if from within. Unless the bleeding is external, visible and superficial, it nearly always requires a search and seizure of the offending vessel when possible. This should be under anesthesia whether it be immediate or delayed hemorrhage as soon as the general condition of the patient permits. This, in our modern hospital with expert assistance at hand and blood banks available, usually means immediately. I agree that improper ligation, slough and infection may cause rectal hemorrhage but would add that a faulty prothrombin level is also not an uncommon cause of postoperative hemorrhage. This may be so in spite of a normal or near normal bleeding and coagulation time which when abnormal likewise is a cause for hemorrhage. Liver function tests may be abnormal. Consequently, in such instances heavy daily doses of intravenous vitamin K are indicated as well as added adjunct therapy as described. Rest and later restricted ambulation may be necessary.

Proper healing in anorectal wounds such as for fissure or hemorrhoids requires, as Dr. Pearson states, careful excision of the anal and perianal skin and the wound edges well beyond the anal verge and, in addition, smooth suturing or ligature of the dissected mucosal base. Adequate skin islands are of great aid in proper healing. Differing from Dr. Pearson, I believe a complete and clean excision of the underlying island isthmus prevents edema and tag formation and permits more normal painless healing. In fact, with redundant skin one may more properly cover an otherwise too exposed anal wound and may by sliding skin attach it with fine silk suture or else use some plastic procedure

such as described by Dr. Carmel or Dr. Belnap. A relaxed and adequate-sized anal canal may require partial external subcutaneous sphincter severance. The normal elastic expanding and contracting orifice requires a wound with a relaxed canal in proper tone. A wound cleanly dissected and sutured is necessary for this status.

The normal wound shows granulations on the fifth postoperative day. Daily care with skin edge separation, cleanliness and wound distention by periodic canal distention other than by forceful dilation permits healing by epithelization. The mucosa in such wounds heals first and the epithelium must not be traumatized by tinctures or cauterization. Excessive granulations may be removed but the wound must be treated carefully so as not to destroy the newly formed almost invisible epithelium.

An improperly draining wound complicated by stenosis, excessive scar or stricture may again require surgery which, when necessary, although partial requires the same complete and careful excision and care of the initial surgery. In such cases or in delayed healing care must be taken that some type of bowel infection or parasitic disease such as an amebiasis is not coexistent. Even though not proven, trial treatment on such a supposition is often beneficial. Vitamin therapy with heavy doses of cevitamic acid are likewise of benefit.

Pain results from anal spasm or from sensory nerve involvement. This may be from skin suture, muscle suture and edematous or infected wounds. Smooth, experienced surgery avoids such complications. Pain, likewise, may be minimized through the use of oil soluble anesthetics; I routinely use 1 to 3 cc. doses of procaine in oil perianally at surgery.

The avoidance of complications in abscess, fistula and sinus operations are not mentioned. Their treatment, of course, would be another chapter in this discussion, and therefore will not be enlarged upon. However, a complete symposium on pre- and postoperative complications of rectal surgery should include them.

The excellent paper by Drs. Johnson and Schilla summarizing all the varied methods of pre- and postoperative care of anorectal cases by some 350 of our Society members is of lasting importance to us if we are to keep open-minded and well informed on all methods used. If in the various cited groups of method management we are with the majority, we should not blindly remain too self-satisfied but be ready to improve ourselves by newer proven means; and if we find our individual method to be one used by only a few or a minority, we should be certain and careful that our choice and judgment is correct. We are well fortified by this timely summarization.

In conclusion, these papers illustrate an important rule in the consideration of all treatises, namely, that whereas from one point of view there may be nothing new under the sun, in another sense a condition or a method properly explained and demonstrated may be new and worthy of sincere attention.

J. Grady Booe (Bridgeport, Conn.): I agree with Dr. Pearson that the simple and most common complications of anorectal surgery are often treated lightly and thus may become serious. When the patient comes to the physician with a rectal ailment, it is his deepest concern and should be regarded so even though to the attending surgeon it may appear to be a very minor condition. Sympathy and understanding of the patient's fears will develop confidence and cooperation. During operation all tissues should be handled gently, avoiding trauma as much as possible, and there should not be more than two fingers' dilation of the anorectal canal. All skin tags should be removed at the time of operation as an aid to future cleanliness and to avoid pruritus. I inject 10 cc. of 40 per cent alcohol intradermally and into the sphincter muscle as a routine measure to lessen postoperative pain. I use an insulin or other small caliber needle and inject at fifteen or twenty points radially. This anesthetizes the sensory nerve terminals and gives partial anesthesia for several hours to several days in some cases. I have had many patients who never complained of pain postoperatively when this has been used. It never pools or causes infection. I use repeated warm, wet applications as soon as the anesthesia wears off and sitz baths the day following operation. I believe that no form of plug or rectal pack should ever be used following hemorrhoidectomy. A small strip of gauze or rubber tissue drain to prevent the sides of the wound from adhering and to allow the escape of flatus is good judgment. To plug the anal canal not only causes postoperative pain, tenesmus and the retention of urine but also indicates, I believe, that the operator is not sure of his own surgery.

Dr. Rolens is to be congratulated on bringing to our attention the methods he has for the control of bleeding following anorectal surgery. Hemorrhage, even though it may be slight, should be treated as a serious matter at the earliest possible moment. Postponed treatment or neglect in taking care of oozing may cause the patient to become seriously alarmed in addition to the effects of the loss of blood. Some of the most commonly used agents to check bleeding are thrombin, fibrin foam and oxidized cellulose. All clots should be removed before their application in latent hemorrhage. Oxidized cellulose provides an excellent postoperative dressing following hemorrhoidectomy and for open pilonidal wounds. It is especially valuable

when used to stop the oozing of minute capillaries. It does not have to be removed but stays in place as part of the dressing. Within twenty-four hours the oxidized cellulose material undergoes marked changes. It becomes soft, friable and dark in color. It facilitates hemostasis whether it is used in packing a sinus or following hemorrhoidectomy. If adequate, careful surgery has been performed, these agents will not have to be used as a routine measure but only as a preventative.

I was very much interested in hearing about Dr. Hart's experience with the use of nitric acid in the treatment of postoperative wounds and the results he has obtained. I have had no experience with it. Ten years ago I read a paper before this Society on "The Use of Cod Liver Oil Ointment in the Treatment of Rectal Sinus and Fistula." I still use it routinely and find this ointment a most helpful and satisfactory agent in promoting healing and shortening the time of recovery. During this time I have not had a recurrence and many of these cases were patients in a tubercular sanatorium and had definite pulmonary involvement. I agree with Dr. Hart that it is important to allay the patient's fear and instruct him regarding what he may expect in the way of pain and discomfort following operation. Instructing the patient in caring for himself postoperatively teaches self-reliance which will hasten recovery. A sedative the evening before operation insures a good night's sleep and dispels fear. I give an enema the night before but never the day of operation. I always place a small piece of gauze in the rectum at the beginning of the operation to prevent blood from passing upward, and remove it at the end of the operation. I have had no experience in the use of bulk laxatives as a retention enema but it warrents consideration.

Drs. Johnson and Schilla have compiled much valuable information from their questionnaires. The summary of this extensive study somewhat standardizes the general principles for anorectal surgery by the majority of proctologists. They are to be congratulated for their work in compiling this helpful review. It will serve as a true guide for the proctologist and if followed will afford the patient comfort in convalescing and excellent results will be obtained.

Lester S. Knapp (Buffalo, N. Y.): Dr. Pearson has taken under consideration our main problems involving anorectal surgery. I am in accord with his underlying principles and find little to criticize or improve. Possibly re-emphasizing a few points may not be amiss. In reference to pain I have been unable to operate without pain and have found nothing to eliminate a certain degree of it. I believe the operator is at fault in many degrees of pain production. I believe in the simplest form of radical procedure in operation on the anal canal. Rough handling of the muscles, radical divulsion of sphincter, indiscriminate use of ligatures all produce pain. I do not sink a ligature with a needle except as an emergency measure since infection will follow it throughout its course.

Infection is our number one difficulty in the anal canal and the greatest producer of pain. The proper approach to our surgery is to direct our strategy to good drainage. The marked improvement in anesthesia has been a great help, and the anesthesia department has given us help in the prolongation of the postoperative relief period.

I do not use anesthetic ointments routinely although at times they are of help. I have had several severe dermatitis medicament cases as the result of their use.

I handle early hemorrhage following operation evidenced by concealed shock symptoms as Dr. Pearson does by immediate return to surgery.

I believe in hospitalization immediately for delayed or later hemorrhage which occurs at home. Some of the patients, however, stop bleeding from drop in pressure, but the majority I return to surgery and here I admit at times I have used a needle to ligate above retracted vessels.

We all get skin tags at times following our surgery which are very distressing to the patient and embarrassing to the doctor, especially when the patient comes in for a dressing and says, "Doc, you missed one." If an operation was adequate, we would have very few skin tags. Drainage is very important and one other factor is the pudendal vessels that become subcutaneous from the outside border of the external sphincter. A slight swelling is in evidence by the time the operation is finished. The wound should be enlarged to this area or this area handled similar to a thrombotic and ligated.

Stenosis and stricture is the real bugbear of the surgeon and is the direct result of infection. Inadequate surgery with poor drainage is a great factor in this occurring infection. However, many ill devised operations do not stricture as we all know. I see some of mine and wonder why I do not have more strictures. You will observe many more strictures in high tension peoples or races than in the more phlegmatic types. Tension and spasm with poor drainage is the big factor with these people. If infection does occur, I treat it as an infection, discontinue dilation and concentrate on curing the infection first. After the infection is cleared, many will gradually improve without surgical interference. Proctotomy is indicated where difficulty in bowel movement persists. Skin constriction and local bands are released in the office, but when proctotomy is done the patients are hospitalized. More scrupulous postoperative care of wounds will help decrease this complication.

Regarding the paper by Dr. Rollens, massive postoperative hemorrhage is always a serious com-

plication that we all dread to see whether it is in the early hours of the morning or at high noon.

Fortunately the early type of hemorrhage occurs soon after surgery in the hospital where it is usually discovered early by the staff before it has become too serious. Early return to surgery with ligation, of course, is indicated.

Delayed or late hemorrhage after discharge from the hospital, occurring at home, becomes a real problem before the physician is contacted. I believe that all patients should be hospitalized and if possible returned to surgery, with ligation and suture. However, there are occasions when the patient cannot get to the hospital or if the physician calls at the home he finds immediate measures must be carried out to save the patient's life; then a pack is indicated at once. I can recall having such an emergency with nothing but a roller bandage in my kit. Even this bandage folded back and forth a few times with the center tied to a string like a bow tie placed through a proctoscope with tension exerted by pulling on the string saved a patient's life. For several years after that I carried a pack similar to the one described by Dr. Rollens. The late Descum McKenny always had such a pack on our service at the hospital. The advantage of the pack of Dr. Rollens is that pressure is applied at the lower levator level and also from the external side. There is no question but it is an effective pack. I have used on numerous occasions this accordion type pack to hold hemorrhage until hospitalized. If control is complete, I watch the case carefully; if there is any question of doubt, I return the patient to surgery for ligation. I have to admit that I feel safer when I return the patient for ligation.

In the cases in which the patient makes the hospital I have had no difficulty in controlling the hemorrhage by surgical means. Massive hemorrhage after hemorrhoidectomy occurs from the superior hemorrhoidal vessels. These vessels can be picked up above the sloughing pedicle in the normal mucosa. It is even justifiable to use a needle and sink a ligature to pick up the bleeders. In our cases we have never had to return to surgery but once for a hemorrhage.

The type and severity of the hemorrhage would govern me in regard to lesser methods than surgery.

Dr. Hart's paper has me in a very precarious position since I have never used his method nor have I seen its results. The two claims of the nitric acid method are relief of pain and prevention of too rapid healing of the wounds.

It is true that the effect of nitric acid on skin margins would seal off the fine nerve endings and there should be a decrease in postoperative pain. Also, any careless use might seal off the natural drainage areas where drainage is indicated. Dr. Hart's second claim for this method, that it checked too rapid healing, is the point I would think is the greatest argument against the use of nitric acid. A burnt skin edge has to slough off before healing occurs, so healing is delayed. I think I would rather devise my wounds for drainage and get as fast wound healing as possible.

The use of retention bulk enemas handled in this matter by trained help would undoubtedly make a smoother bowel movement. We have tried all sorts of recommended materials and have reverted to early normal function if possible and when necessary the use of oil instillation and plain warm water enema.

I heartily agree that blood is irritating in the rectum or blood any place in the gastrointestinal tract will cause cramps and discomfort.

Dr. Hart's last point is most important. To sell the patient first on the doctor and then the operation, giving rather complete information regarding the operation and what is to be expected, is one of the greatest factors of all. This is not only good psychology but also good salesmanship.

The survey on pre- and postoperative care by Drs. Johnson and Schilla to me is a most interesting one and I am very glad to see that there is such a tendency toward the standardization of pre- and postoperative care. It is quite evident that many of the old hand-me-down customs are going by the wayside. There will always be variation in this type of care due to the various experiences of the men with as many interpretations of results. We seem to be fairly unified in the over-all picture.

The laboratory studies are so well outlined by the College of Surgeons that we have our basis well established by them.

Our field of surgery requires as clear a field as possible and I am definitely in sympathy with the perianal shave that does not include the pelvic area.

We discontinued the use of antibiotics a few years ago as we saw no real advantage in their use. We wished to create no sensitivities to bother the patient in the future.

The use of cathartics and enemas is one of the brutalities that has passed by and justly so. We still use a cleansing plain water enema the night before surgery, none on the day of surgery, and allow a light soporific for sleep. We have tried a series of patients without preparation and many did well; however, we believed over-all results were better and we should revert to this minimum preparation.

Spinal anesthetic is our choice and for the patient afraid of spinal we use pentothal® and curare. Pentothal® alone is unsatisfactory in our hands. We used oil anesthetic agents several times and believe that the end results are better without them. Abscess, muscle fibrosis and more tendency toward stenosis were our problems. Proper drain-

age with adequate surgery and early normal function will help the patient in regard to pain. Morphine and demeral the first night with codeine and aspirin the next day supplemented with hot sitz baths are universal.

We have found nothing that will prevent the necessity of catheterization in many cases. I do not want my patients to overdistend their bladders for I believe that more cystitis cases are caused by this than by catheterization. We allow bowel movement at any time and use enemas on the third postoperative day. We discharge the patients from the hospital on the fourth day postoperatively.

I think we have tried most of the fads in our field and have come down to several fundamental principles, namely, (1) careful handling of tissues, (2) adequate surgery and good drainage of wounds and (3) keep close to normal function. If these are observed, I believe good results will follow. Possibly I can sum up with one word: simplicity.

Mark M. Marks (Kansas City, Mo.): I cannot but feel some responsibility to the problem of oil-soluble anesthetics since Dr. Manheim and I added the work on eucupin some fourteen years ago. Experience with this form of supplemental anesthesia has taught that muscle injection is not without danger and should not be done in proctologic surgery.

An improved technic which has been used throughout four years of busy proctologic army service and which is still being used is to use equal quantities of 2 per cent procaine hydrochloride and an oil-soluble anesthetic agent. This is emulsified temporarily by agitation and injected anteriorly under the perineal skin, laterally along the side of the external sphincters and posteriorly into the postanal space.

Nesselrod in his recent book states that those who do and those who do not use oil-soluble anesthetics have the same number of postoperative abscesses. I am inclined to agree with this since our few complications must likewise be due to poor placement of sutures, constriction of excessive tissue and inadequate drainage. The thing to remember is that the use of oil-soluble anesthetics does not preclude good surgical technic.

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EVALUATION OF CHLOROMYCETIN AS AN ADJUNCT TO THE SURGICAL MANAGEMENT OF LYMPHOGRANULOMA VENEREUM AND SEGMENTAL ULCERATIVE COLITIS*

ROBERT J. ROWE, M.D.
Dallas, Texas

LYMPHOGRANULOMA venereum is one of the few remaining infectious diseases which has maintained a relatively impregnable defense against the onslaught of the newer chemotherapeutic and antibiotic substances. Although the sulfonamides, penicillin and streptomycin have been valuable adjuncts in combating the secondary infection associated with lymphogranuloma venereum, until quite recently no specific therapeutic agent has impeded successfully its devastating effects upon the lower bowel and anorectum.[7,8]

Management of the advanced rectal lesions characterizing this disease still remains problematical as well as controversial. Conservative therapeutic measures including use of numerous oral medications, Frei antigen, sulfonamides, repeated dilatations, estrogenic substance, irrigations with various medications, diathermy and proctotomy have proven satisfactory in some of the less severe anorectal infections. Proximal colostomy also has given satisfactory palliative results in the more advanced strictures with obstruction or extensive fistulas. However, one must assume a rather passive attitude to allow the younger individuals with such lesions to endure permanent abdominal stomas. Recently, the trend of treatment in the more advanced rectal strictures has been toward resection and, when possible, re-establishment of bowel continuity. A small personal series consists of two Miles' abdominoperineal resections and four abdominoperineal proctosigmoidectomies without a fatality. Another series has been reported[2] of twenty-five consecutive abdominoperineal proctosigmoidectomies without a fatality. On the other hand, even with improved technics and the general reduction in operative mortality, resection of the rectum and re-establishment of bowel continuity for these benign strictures cannot be lightly undertaken in view of the relatively high attendant mortality rates reported by other authors.[1,9]

Since the indications for surgical intervention and the procedures to be used are still ill defined, those of us who are frequently confronted with the solution of such problems are constantly alert for newer therapeutic measures which may eradicate the causative agent of lymphogranuloma venereum preventing the advance of earlier lesions and rendering the task of surgical intervention less hazardous in the more advanced cases.

Consequently, it was of great interest to us when Ehrlich, Smadel and their colleagues[4] in October, 1947, published reports of a new antibiotic, chloramphenicol or chloromycetin, which seemed to have a specific therapeutic activity against a wide variety of pathogenic organisms. Even more encouraging was the report of Smadel and Jackson in March, 1948,[6] that chloromycetin was effective in experimental infections due to psittacosis and the lymphogranuloma venereum viruses.

A relatively large number of patients with lymphogranuloma venereum are treated at the Dallas Syphilis and Venereal Disease Clinic and on the proctology service of the Dallas City-County Hospital. Upon our request adequate supplies of chloromycetin were granted† for a clinical evaluation of its effectiveness in the treatment of lymphogranuloma venereum. Thirty-two patients with lymphogranuloma venereum have been treated with chloromycetin. Results obtained in this group of patients will provide the principal basis for this presentation. During this study four patients were encountered with non-specific ulcerative intestinal disease. These patients were treated with

† Parke, Davis & Co. supplied chloromycetin and a grant to support this study.

* From the Department of Proctology, Southwestern Medical School of the University of Texas, Dallas, Tex.
This paper received the A. B. Graham Award for 1950.

chloromycetin and the results, although inconclusive, were interesting enough to merit comment and have been included in this discussion.

After engaging in a study of lymphogranuloma venereum one is impressed with certain features of the disease which have not been generally recognized and others which have not been adequately investigated. It seems pertinent, therefore, to mention a few of the less widely known facts which are related to the etiology, incidence, pathology, diagnosis and clinical course of the disease.

So far as the etiology of lymphogranuloma venereum is concerned, it is now established that the disease is caused by a filtrable agent. This agent can be identified (as elemental bodies) in smears made from exudates of the acute lesions. It also can be cultured in several ways, more particularly in egg yolk, and its life cycle may be compared to that of the malarial parasite.

Lymphogranuloma venereum is much more common than has been generally supposed and with its tendency to undergo spontaneous regression it is probable that the initial lesions frequently go unrecognized. Wright and others[10] reported the incidence of asymptomatic lymphogranuloma venereum in 1,192 adult negroes to be 28.4 per cent and in a smaller series of 192 white adults 18.8 per cent.

It is quite probable that the virus-like agent infects the anorectum after direct implantation rather than by lymphatic invasion. It is also quite possible that many undiagnosed systemic symptoms may be due to unrecognized lymphogranuloma venereum. Certainly, it is manifested systemically in the eye, meninges, brain, spleen, as erythema nodosum, and in the joints. Carcinoma and lymphogranuloma venereum occur concomitantly so frequently that it is no longer thought to be a coincidence. (Five patients have been seen in our clinics in the past three years.)

The diagnosis has been somewhat simplified by the introduction of the complement fixation reaction. False positive reactions have been described but many of these may be due to latent infection. Our need at present is for a test that distinguishes between the active and quiescent stages of the disease. Recently Bedson[3] has reported a test which holds some promise in this direction. Identification of the elemental bodies is impractical as a routine diagnostic aid.

There is still much to be learned about the clinical course of lymphogranuloma venereum. Perhaps with relative control of the more common venereal diseases, greater interest will be manifested in the study of various lesions produced by this disease.

The research story of chloromycetin is very interesting, almost romantic. When Parke, Davis & Company recently launched a search for new antibiotics, a grant was made to Yale University and Dr. Paul R. Burkholder was placed in charge of the investigation. From more than 6,000 soil samples from every corner of the earth not less than 20,000 types of molds were isolated. A few of these molds with antibiotic activity were sent to the research laboratories for further investigation. Mycologic studies and antibiotic evaluations[5] revealed one sample to be very active. The mycoorganism isolated was designated as Streptomyces venezuelae since the soil sample came from near Caracas, Venezuela. From this organism the active white, crystalline antibiotic was soon isolated. Shortly afterward the chemical nature was determined and chemists called it chloramphenicol. It is a nitrobenzene compound which has been produced both synthetically and by fermentation.

Chloromycetin is relatively non-toxic, very stable and relatively insoluble in water. It is absorbed very readily from the upper intestinal tract and excreted rapidly from the kidneys. It is inactivated rapidly in the body by the liver. It is necessary, therefore, to give the drug at frequent intervals. In our experience administration four times daily has proven satisfactory. Insolubility and local reaction have precluded its intravenous and intramuscular use. It may be given rectally with absorption and maintenance of satisfactory blood levels.

Chloromycetin is effective against undulant fever, gram-negative bacterial infections, especially urinary, typhoid fever, paratyphoid fever, the salmonelloses, the rickettsial infections, primary atypical pneumonia, the psittacosis-lymphogranuloma venereum viruses and non-specific ulcerative colitis. It is also effective against other organisms such as Streptococcus hemolyticus and non-hemolyticus, Str. anaerobius, pneumococcus, Corynebacterium diphtheriae, Clostridium tetani, Bacillus anthracis, Cl. welchii, some strains of Pseudomonas aeruginosa, hemolytic staphylococcus and non-hemolytic staphylococcus.

Chloromycetin should not be used indis-

criminately since resistant strains of organisms tend to appear after prolonged usage.

The present study was begun in May, 1949, when a separate clinic was established at Parkland, the Dallas City-County Hospital, for the primary purpose of evaluating chloromycetin as an adjunct to the surgical therapy of the more advanced rectal lesions of lymphogranuloma venereum. Fourteen patients with rectal manifestations of this disease have been treated since that time. After initiation of the study it soon became evident that a concomitant study of patients with acute genital and inguinal lesions would also be necessary to evaluate properly the effect of chloromycetin upon lymphogranuloma venereum. Consequently, eighteen patients with acute genital and inguinal lesions have been treated. These were referred from the Dallas Syphilis and Venereal Disease Clinic. Results in this group will be reported in more detail in a subsequent publication. This presentation is concerned primarily with the results obtained in the patients with rectal involvement.

TABLE 1
RESULTS OF TREATMENT OF NODULAR ULCERATIVE PROCTITIS

Age	Color Sex	History	Findings	Diagnosis		Treatment	Results
				Frei	C. F.*		
30	C/M	Admits sodomy Treated for lymphogranuloma venereum by V. A. for 1 yr. Pain, bleeding and discharge from rectum, 1 yr.	Multiple submucosal nodules 5 mm. to 1 cm. Severe ulcerative proctitis No stricture	+	1:128	.25 gm. q. i. d., 2 wk. None for 3 wk. .5 gm. q. i. d., 3 wk.	Excellent Asymptomatic in 2 wk. Almost completely healed in 6 wk. Completely healed at next examination 6 mo. later
24	C/F	Discharge and bleeding from rectum four years following genital lesion Vulval sore, four months	Posterior vulval ulcer 4 by 6 cm. Moderately severe ulcerative proctitis Multiple submucosal nodules 5 to 7 mm.	+	1:256	.5 gm. q. i. d. for 1 wk. Did not return for 3 wk. .5 gm. q. i. d. for 1 wk.	Excellent Almost well in 1 wk. Healed completely after second week of treatment
40	C/F	Bleeding from rectum, four years Constipation, four years	Severe ulcerative proctitis Large edematous anal tag and ulcer Multiple nodules 5 mm. to 1 cm. Narrowing 2 cm. No definite stricture	+	1:32 (after treatment)	.5 gm. q. i. d., 4† wk. .25 gm. q. i. d., 4 wk. .5 gm. q. i. d., 2 wk. .25 gm. b. i. d., 4 wk.	Fair Marked systemic improvement, 2 wk. Ulcer healed and proctitis improved in 1 mo. Stricture 1.8 cm. and proctitis present after 6 mo.

* Complement fixation.
† Dosage varied because of diarrhea.

Studies have included Frei and complement fixation tests, proctologic and genital examinations. Direct smears from the lesions and smears of aspirated purulent material were examined for elemental bodies. More recently the size of the rectal strictures and improvement in these strictures following treatment has been measured. No other medications were prescribed for these patients. Chloromycetin was not administered to any patient until a positive Frei test was obtained and in questionable patients treatment was withheld until a positive

complement fixation reaction was forthcoming. Blood counts were performed on a number of patients but no studies were made on the blood levels obtained with the dosage of chloromycetin prescribed and no tests for toxicity were used other than clinical observation. In the beginning of the study .25 gm. of chloromycetin was administered four times daily to a few patients. The majority of the patients received .5 gm. four times daily. Most of the patients with rectal lesions received chloromycetin 2 gm. daily for thirty days or longer. In view of the excellent result obtained in one patient who inadvertently received .25 gm. daily for nearly four months, the same dosage was administered to several other patients for variable periods of time. Daily 3 gm. were given to several patients.

The majority of the patients were observed at weekly intervals. Two were observed for only thirty days, but the remainder of the patients were seen for periods of time varying from three months to one year. None were hospitalized except the three who were submitted to resection.

For convenience of discussion the patients have been divided into three groups, namely, (1) nodular ulcerative proctitis, (2) ulcerative proctitis with strictures and (3) the acute genital and inguinal lesions. Four patients with segmental ulcerative intestinal disease were treated with chloromycetin and comprise the fourth group. No special studies were performed on these patients.

Three patients were classified under the category of nodular ulcerative colitis since their lesions were more advanced than the early diffuse ulcerative proctitides, but definite strictures were not present. Results in this group are summarized in Tables I and II. They were considered excellent in two patients and only fair in the third patient. The first two were apparently cured while the third patient still had a stricture and ulcerative proctitis at the end of six months. The possibility of amebiasis or other complicating factors was considered but none could be identified. Undoubtedly this patient had lymphogranuloma venereum since smears from the rectum contained elemental bodies.

It is difficult to summarize the results in the group of eleven patients with ulcerative proctitis and strictures without presenting detailed case reports since each patient presented a different pathologic picture and the results were somewhat variable. In Table II the patients have been divided into the following two types: tubular strictures and diaphragmatic strictures. The results have been classified generally as excellent (four patients), good (three patients), fair (three patients) and poor (one patient).

TABLE II
RESULTS OF TREATMENT OF ULCERATIVE PROCTITIS WITH STRICTURE AND NODULAR ULCERATIVE PROCTITIS

	Excellent	Good	Fair	Poor
Tubular (9)	A. R. 2 R. F.	O. D. 3 F. W. L. W.	E. D. 3 E. F. D. R.	1 M. S.
Diaphragmatic (2)	R. S. G. 2 B. K.	0	0	0
Nodular Ulcerative Proctitis (3)	W. B. 2 R. R.	0	1 M. H.	0
Total (14)	6	3	4	1

Perhaps this is a rather conservative evaluation since the results were fully as good as one would expect in patients who were afflicted with extensive fibrous strictures. Table III contains a summary of the results obtained in the individual patients.

Frei tests were positive in all patients and complement fixation reactions were as follows: 1:32 in two patients, 1:64 in one patient, 1:128 in six patients and 1:256 in two patients. Smears of rectal exudates were positive for elemental bodies in one patient (patient D. R., Table III). Marked relief of systemic symptoms and improved general well-being was consistently present in all patients after one week of therapy. Subjectively, marked improvement resulted in all of the patients within two weeks after institution of therapy. Laxatives were usually discontinued after two weeks of therapy. The possibility of the laxative effect of chloromycetin was considered, but the patients with acute genital and inguinal lesions served as controls and no significant change in bowel habit was noted in this group except transitory diarrhea in two instances which was apparently not due to chloromycetin.

The dosage of chloromycetin varied rather

TABLE III

RESULTS OF TREATMENT OF ULCERATIVE PROCTITIS WITH STRICTURE

Patient	Age Sex	History Findings	Frei	C. F.¶	Treatment	Results
R. S. G. (E)*	C/F 24	Constipation, blood, pus and mucus, 1 yr.; no bowel movement, 5 da.; daily laxative; diaphragmatic stricture 1.3 cm.; moderately severe ulcerative proctitis	+	1:128	.25 gm. q. i. d., 1 wk. .5 gm. q. i. d., 4 wk.	Marked improvement 5 wk.; proctitis healed; stricture 1.8 cm.; no laxatives
B. K. (E)	C/F 42	Six-month old proctotomy; very little improvement; diaphragmatic stricture 1.3 cm. Moderately severe ulcerative proctitis	+	1:128	.25 gm. q. i. d., 6 wk. .5 gm. q. i. d., 6 wk.	Marked improvement in 2 wk.; stricture dilated to 1.8 cm. rapidly then slowly to 2 cm. after two months; four months later stricture almost obliterated; ulcerative proctitis healed
A. R. (E)	C/F 39	Proctotomy March, 1947, and 1949 (two months before treatment); severe tubular stricture 6 cm. by 1.4 cm. with large granulating wound, posteriorly	+	1:128	.25 gm. q. i. d., 5 wk. .5 gm. q. i. d., 1 mo.	Marked improvement in 1 mo. although stricture tended to contract 1.2 cm.; end 8 mo. proctitis healed; stricture 1.8 cm.
R. F. (E)	C/F 39	Almost complete obstruction; daily laxatives or enema; referred for operation Severe tubular stricture and proctitis Did not admit tip of finger or small scope	+	1:128	.5 gm. q. i. d., 4 wk. Did not return for 4 mo. Used chloromycetin .25 gm. once or twice daily for almost 4 mo.	Marked local and systemic improvement 1 mo.; result at end of 4 mo. and 9 mo. amazing; complete healing; regeneration of mucous membrane; bowel more pliable; stricture larger than 2 cm.; no laxatives
O. D. (G)†	C/F 26	Partial obstruction; stricture 1 cm.; ischiorectal abscess; weight 75 pounds	+	1:32	Incision and drainage of abscess; 2 wk. later chloromycetin started .5 gm. q. i. d. for 1 mo.	25 lbs. weight gain in 1 mo.; wound healed and no fistula; stricture 1.5 cm.; no laxatives; normal bowel movement; asymptomatic; no further examination
F. W. (G)	C/F 66	Urinary and partial fecal incontinence; advanced stricture 1 cm.; 2 fistulous openings, vaginal and urethral involvement	+	1:128	.25 gm. q. i. d., 2 wk. .5 gm. q. i. d., 2 wk. (patient did not return after 4 weeks.)	Marked improvement 2 wk. Urinary continence in 4 wk., no laxatives; closure of fistulous openings; stricture same size
L. W. (G)	C/F 49	Incontinence; rectovaginal fistula; advanced tubular stricture 1 cm.; anal esthionone	+	1:256	.5 gm. q. i. d., 30 da. .25 gm., 2 wk.	Marked improvement 2 wk.; better control; marked improvement 1 mo.; no perineal pad; stricture 1.5 cm.; fistula present; patient refused resection
E. D. (F)‡	C/F 53	Abdominal cramping; alternate constipation and diarrhea 1 yr.; tubular narrowing of entire rectum and rectosigmoid 2 to 2.5 cm.; moderately severe proctitis	+	1:32	Intermittently .25 gm. q. i. d. alternating with .5 gm. q. i. d. (because of diarrhea) for 10 wk.	Questionable diagnosis; probably lymphogranuloma; diarrhea partially due to chloromycetin; proctitis improved; size of rectum same. Patient thought she was well and did not return after 10 wk.
E. F. (F)	C/M 44	Transverse colostomy for obstruction 2 mo. prior to admission; severe tubular stricture 9 cm.	+	1:128	.5 gm. q. i. d., 6 wk. Dilatation of stricture	Patient felt markedly improved; stricture did not remain open in spite of dilatations; resection and abdominoperineal proctosigmoidectomies and colostomy closure; lesion tuberculous and lymphogranuloma venereum (probably)
D. R. (F)	C/F 42	Transversostomy 2 mo. before admission; .6 cm. stricture; profuse discharge and ulcerative proctitis; elemental bodies in smear	+	1:64	.5 gm. q. i. d., 8 wk. Dilatation of stricture	Stricture increased to 1.4 cm. and discharge ceased; patient gained weight and felt markedly improved; stricture tended to contract without fecal current; resection, abdominoperineal proctosigmoidectomies and closure of colostomy
M. S. (P)§	C/F 33	Constipation and bleeding for 1 yr.; tubular stricture 1.5 cm. entire rectum; weight loss 1 yr. weight 86 pounds; anemia	+	1:256	.5 gm. q. i. d., 3 mo. Dilatation of stricture	Patient felt improved in 2 to 4 wk.; abdominoperineal proctosigmoidectomies and bowel movement much easier; moderate healing of stricture but remained same size; no gain in weight; anemia continued; Miles' resection 3 mo. observation

* Excellent; † Good; ‡ Fair; § Poor; ¶ Complement fixation.

widely but apparently the most satisfactory results were obtained with a minimum of 2 gm. daily. No advantages were noticed in using small doses for prolonged periods of time. Although 3 gm. daily were administered to several patients, this dosage was not used enough for an accurate comparative evaluation.

Two patients with diaphragmatic strictures (patients A. R. and B. K. in Table III) had proctotomies performed prior to treatment with chloromycetin. The strictures had reformed in both patients but these responded excellently to chloromycetin. Six months after beginning of treatment the proctitis was healed and the strictures were obliterated almost completely. Another patient (patient R. F. in Table III, included among those with excellent results) had a severe ulcerative proctitis and long tubular stricture with almost complete obstruction. Resection was thought to be inevitable, but six months after treatment was started there was amazing resolution of the stricture (2 cm. in diameter) and healing of the entire rectum. All three of these patients were considered to have obtained excellent results from treatment.

One sixty-six year old colored female (patient F. W., Table III) had urinary incontinence, vaginal invasion, two ischiorectal fistulous openings and mild incontinence. In four weeks urinary and fecal continence returned and the fistulous openings closed. She did not return after four weeks. This patient was classified as a good result. Two other similar cases were placed in this classification. Excellent results might have been obtained in these patients had they been available for longer observation and treatment.

In the fair group two patients (E. F. and D. R., Table III) had transverse colostomies six to eight weeks prior to treatment. They improved generally and felt much better after being treated with chloromycetin, but evaluation of the physical improvement was impossible without the dilating effect of the fecal stream. Both strictures contracted in spite of dilatations. Recently abdominoperineal proctosigmoidectomy with preservation of the sphincter and subsequent closure of the colostomies has been performed with very good results. The male (patient E. F., Table III) apparently has tuberculosis and lymphogranuloma venereum. His resection was rather difficult but resection in the female was much easier than the average resection for stricture (whether chloromycetin was responsible for this is doubtful). The third patient with a doubtful result (patient E. D., Table III) had a peculiar tubular narrowing of the entire rectum and rectosigmoid. Large doses of chloromycetin caused her to have diarrhea, but in spite of this she was markedly improved subjectively and objectively at the end of two months.

TABLE IV
RESULTS OF TREATMENT OF ACUTE GENITAL AND INGUINAL LESIONS

	Time Required for Apparent Clinical Cure			
	Excellent		Good	
	1 Week	2 Weeks	3 Weeks	4 Weeks
No prior treatment.. (10)	3	7	0	0
Prior treatment with sulfones..... (8)	2	2	3	1
Total..... (18)	5	9	3	1

One failure must be listed in this group. A thirty-three year old colored female (patient M. S., Table III) with a stricture involving almost the entire rectum had adequate treatment with chloromycetin for two months. The ulcerative proctitis improved, but there was relatively little change in the caliber of the stricture. She felt much better but did not gain weight and her anemia continued. A Miles' abdominoperineal resection was performed since there was not adequate uninvolved sigmoid to reach the perineum safely.

Eighteen patients, six colored females and twelve colored males, with acute genital and inguinal lesions have been treated with chloromycetin. Results have been summarized in Table IV. Five patients were apparently cured in one week, nine patients in two weeks, three patients in three weeks and one patient in four weeks. Three other patients with similar lesions were given enough chloromycetin for one week's treatment. They did not return for a check-up and consequently were not included in evaluating the results.

1A 1B

FIG. 1. A, typical penile lesion with positive Frei and complement fixation reaction for lymphogranuloma venereum; no other demonstrable cause; treated for five weeks with sulfonamides. B, same patient after three weeks' chloromycetin therapy (2 gm. daily); ulcer completely epithelized.

Frei tests were positive in every patient. The complement fixation reactions were also positive in all but four patients who were seen early in the study and blood was not obtained from them. The reactions varied from 1:16 in one patient and 1:64 in another patient to 1:128 in a majority of the other patients. These reactions were repeated on three patients four to eight weeks after beginning of treatment and there was no significant change in the titer of agglutination. In one patient who had been treated six months previously for early lesions the complement fixation was negative. In another patient with a suppurative inguinal lesion the complement fixation reaction changed from 1:128 before treatment to 1:64 one month after treatment was started.

An intensive search was not made in all patients for elemental bodies since identification of these bodies was not deemed of practical diagnostic value. After reviewing our results it appears that more industrious efforts would have been rewarded by a higher percentage of positive smears. In this group the exudates from the acute lesions of three patients were examined and no elemental bodies were found (smears made from the exudates of two patients with ulcerative proctitis contained numerous elemental bodies). Pus was aspirated from nine patients with inguinal lymphadenopathy and repeated aspirations were done on five of these patients one week later. Studies of this material are not complete and attempts to recover the virus will be made at a later date. Six of the initial smears have been studied. Three were definitely positive for elemental bodies and three were questionable. One week later repeated smears from the three positive patients were negative. This is an interesting observation, indicating that chloromycetin may be effective against the virus. It is not conclusive since identification of the elemental bodies is very difficult.

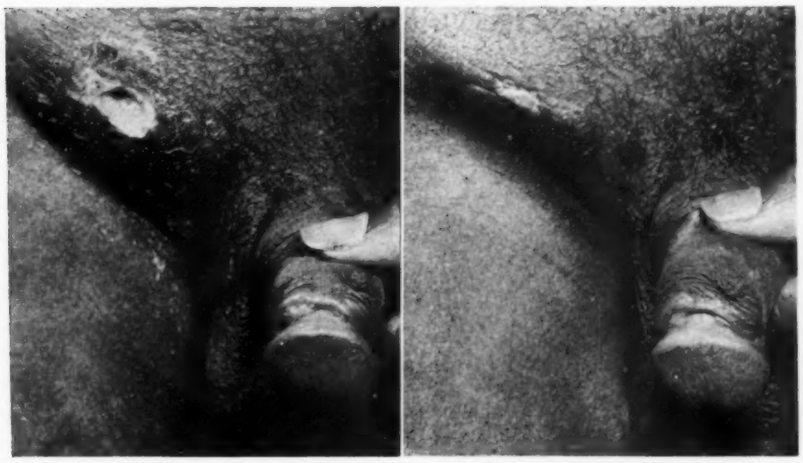
No significant toxic manifestations were noted in this group. Two patients had a transient diarrhea but were later treated with large doses of chloromycetin and there was no return of the diarrhea.

A few remarks should be made concerning the most notable results. One patient with a large penile lesion of five weeks' duration (Fig. 1) failed to respond to sulfonamides but was cured within three weeks after being placed on .25 gm. of chloromycetin four times a day. Two patients (Figs. 2 and 3) had draining sinuses in the inguinal region with matted inguinal lymphadenopathy. The sinuses had both sealed over after one week of therapy (.5 gm. of chloromycetin four times a day). One of these patients was well in three weeks (Fig. 2) and the other required four weeks for complete subsidence of the lesions. (Fig. 3.) As in the other groups systemic symptoms were manifest in all the patients and these disappeared after one week of treatment. Figure 4, is typical of the acute genital and inguinal lesions which were cured in seven to fourteen days.

It has been impossible to follow adequately the females with genital and inguinal lesions. One patient was followed for six months, one patient for three months and two patients for two months. There was no evidence of rectal involvement at the end of this time.

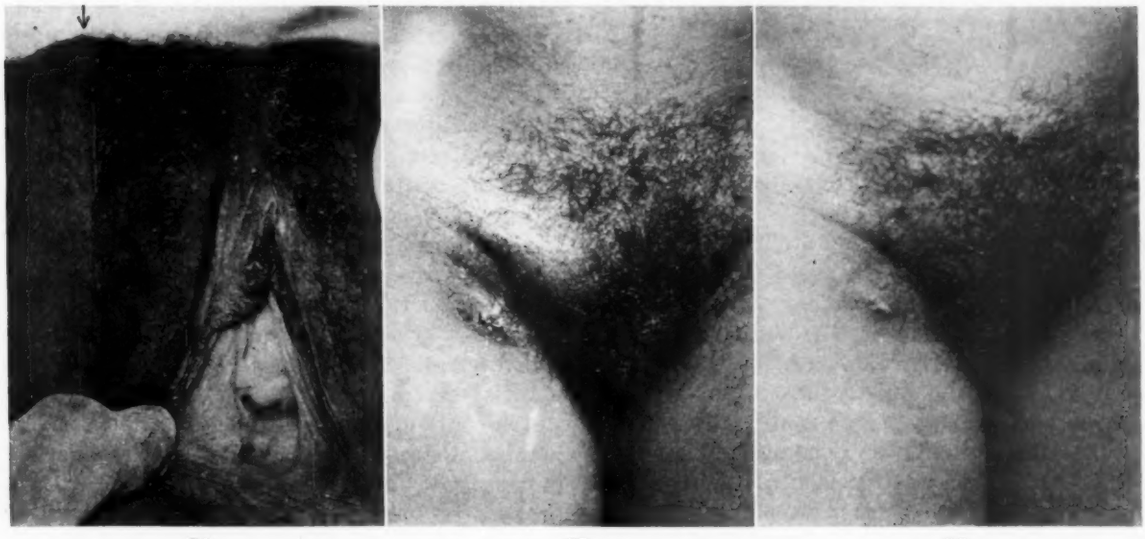
During the early phases of this study four patients were encountered with non-specific ulcerative intestinal disease. A brief discussion of each case is necessary to depict the results.

The first patient had severe perineal infection with recurrent abscesses and a rectovaginal fistula. For adequate drainage it was necessary to divide completely the sphincter muscle but, in spite of this, abscesses continued to form. At this time there was no gross evidence of ulcerative rectal disease. A sigmoid colostomy was performed to divert the fecal stream and prepare the perineum for plastic surgery.



2A 2B

FIG. 2. A, acute suppurative inguinal lesion before treatment. B, same patient three weeks after treatment with chloromycetin (2 gm. daily).



3A 3B 3C

FIG. 3. A and B, acute genital and suppurative inguinal lesion treated for three weeks with sulfonamides. C, same patient after three weeks' chloromycetin therapy (2 gm. daily).

Shortly afterward the patient began to have bloody diarrhea and proctocolitis became evident with involvement of the transverse and ascending colon and ileum. She continued to have perineal abscesses and only weighed 107 pounds. Chloromycetin 3 gm. daily was instituted with a remarkable relief of symptoms. The perineum healed; abdominal cramping and diarrhea subsided; and the patient gained 40 pounds in weight. Examination of the bowel revealed that the ulcerative process was still present. Recently, this patient has had two rather severe exacerbations. The first was controlled with chloromycetin. She is in her second exacerbation at present and has failed to respond as rapidly to chloromycetin.* It appears that the organisms which previously were influenced by chloromycetin may now be resistant.

A second patient also had extensive perineal infection with a rectovaginal fistula. A sigmoid colostomy and unsuccessful repair of the fistula had been performed before this patient came under our observation. The disease was confined to the rectum and rectosigmoid but was still active with recurrent perineal abscesses. Marked improvement and complete healing of

* Recently, ielostomy and subtotal colectomy were performed upon this patient.

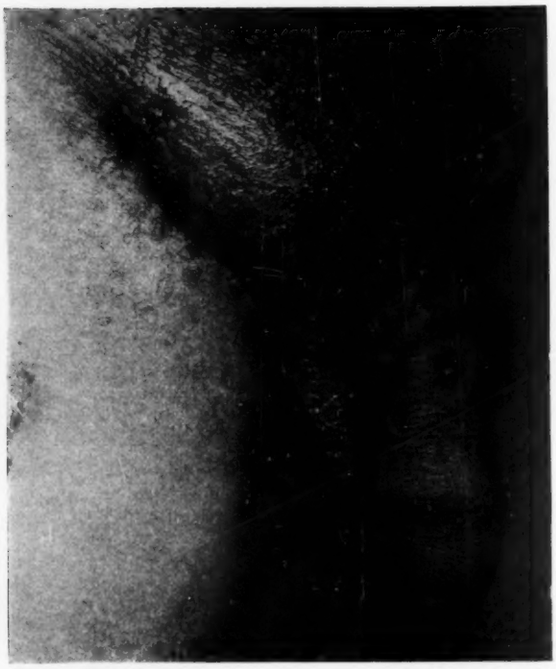


FIG. 4. Typical example of acute inguinal lymphadenopathy which disappeared after two weeks' therapy with chloromycetin (2 gm. daily).

the perineum occurred after chloromycetin was administered. The patient is asymptomatic but still has ulcerative proctitis which has precluded perineal repair.

The third patient had segmental ileitis and sigmoiditis with complete obstruction of the ileum except for a very small ileosigmoidal fistula. The patient was decompressed with a Miller-Abbott tube. Resection of the involved ileum and sigmoid was performed *en bloc* with end-to-side ileocolostomy and exteriorization of the sigmoid. The patient continued to have diarrhea even after the colostomy spur was crushed. Institution of chloromycetin was followed by immediate subsidence of the diarrhea. The patient improved rapidly, began to have normal stools within one week and after one month of therapy the colostomy was closed. At the first operation the patient weighed 83 pounds and four months postoperatively weighed 127 pounds. She has had no clinical evidence of recurrence of her disease although x-rays three months after operation revealed minimal involvement of the ileum near the ileocolic anastamosis.

The fourth patient was a male fifteen years old with ulcerative proctocolitis. The rectum and rectosigmoid were involved more extensively and the patient was having moderately severe bloody diarrhea with persistent weight loss. The rectal mucous membrane was diffusely ulcerated, friable and granular. Chloromycetin was administered, 3 gm. daily, and within two weeks' time the diarrhea and other symptoms had completely subsided. At the end of six weeks the rectal mucous membrane appeared to be normal.

In view of the fact that only fourteen patients with lymphogranulomatous rectal lesions have been treated with chloromycetin, one must be conservative so far as final conclusions are concerned. Evaluation of results is very difficult since so little is known about the clinical course of the disease. Undoubtedly, there are varying degrees of spontaneous regression in many patients with lymphogranuloma venereum. It was not our remotest hope that chloromycetin would resolve the advanced fibrous strictures of lymphogranuloma venereum, but the results obtained in several patients with such lesions were remarkable. Of the fourteen patients with rectal lesions only one obtained a poor result. It was impossible to evaluate accurately the effect of chloromycetin on the patients with colostomies. The remaining eleven patients obtained very good results. Stricture formation probably was prevented in two of three patients with nodular ulcerative proctitis. The third patient obtained a relatively poor result although marked improvement occurred. Resection was recommended for one patient and refused. Another patient who failed to return after one month probably would have required resection. Six patients remained who apparently will not require surgical intervention. It would appear from these results that chloromycetin alone or in combinations with dilatations and proctotomy will preclude abdominoperineal resection in all but a small percentage of patients with lymphogranulomatous rectal lesions. It may also prove to be a useful adjunct in preparing some of the advanced cases for resection and obviate proximal colostomy.

In the group of eighteen patients with acute genital and inguinal lesions there was not a single failure although one patient required four weeks for a cure. The remainder of the patients were all well within three weeks or less and a majority of the patients were cured in two weeks. As in the more advanced lesions the varying clinical course of this disease makes

evaluation of results of treatment most difficult. In view of the fact that eight of these patients had received previous sulfonamide therapy with little or no response the results are even more significant. Actually, these patients alone constitute a control group testifying to the effectiveness of chloromycetin. In the four female patients followed for two, two, three and six months, respectively, no evidence of lymphogranulomatous involvement of the rectum existed. If infection of the rectum results from the vulval lesions, this is evidence which indicates that chloromycetin may prevent spread to the rectum and subsequent development of strictures.

Studies on the elemental bodies are not complete but they do indicate that chloromycetin may have a specific action upon most of the strains of the virus-like agent which causes lymphogranuloma venereum. The excellent results obtained in the acute genital and inguinal lesions as well as in the more advanced rectal lesions also indicate that the effectiveness of chloromycetin is due to its effect upon the virus-like agent. Undoubtedly, elimination of secondary infecting organisms is responsible for much of the improvement in the patients with advanced rectal lesions.

Encouraging results were obtained in the four patients with non-specific ulcerative intestinal disease but it was evident in three that chloromycetin had no effect upon the causative agent since the ulcerative process persisted after intensive treatment. No doubt its effect was primarily upon the secondary infecting organisms. Even so, it may prove a useful adjunct in the treatment of this dreaded malady but, as indicated in one patient, resistant organisms may appear after prolonged usage of the antibiotic.

SUMMARY AND CONCLUSIONS

1. The need for a specific therapeutic agent for lymphogranuloma venereum and non-specific ulcerative intestinal disease has been evident. Certain virucidal properties of chloromycetin suggested that it would be of value in this capacity. Adequate supplies of this antibiotic were made available for experimental investigation.

2. Recent advances related to the etiology, incidence, pathology, diagnosis and treatment of lymphogranuloma venereum have been reviewed.

3. The origin, chemistry, pharmacology and bacteriology of chloromycetin have been discussed briefly.

4. Thirty-two patients with lymphogranuloma venereum and four patients with non-specific ulcerative intestinal disease have been treated with chloromycetin. Clinical and bacteriologic studies included history, physical examination, Frei tests, complement fixation reactions, smears for elemental bodies (from the genital, inguinal and rectal lesions), measurement of strictures and clinical observation.

5. Patients have been classified in four categories: nodular ulcerative proctitis (three patients), ulcerative proctitis with stricture (eleven patients), acute genital and inguinal lesions (eighteen patients) and non-specific ulcerative intestinal disease (four patients).

6. Although inconclusive at this time, results indicate that chloromycetin has a specific activity against the virus-like agent of lymphogranuloma venereum. It shows promise of effecting a cure in the acute cases and palliation in the moderately advanced rectal lesions. Its use may preclude extensive surgical procedures such as abdominoperineal resection except in the most advanced rectal strictures. In the latter group it should be a valuable adjunct in preparation for resection.

Results of treatment in the four patients with ulcerative intestinal disease indicate that chloromycetin may be of therapeutic value, but it probably has no effect on the causative agent of the diseases.

Acknowledgment: The author would like to express his appreciation to Dr. W. B. Mantooth, Director of the Dallas Syphilis and Venereal Disease Clinic and also to Dr. S. E. Sulkin, Professor and Head of the Department of Bacteriology for their valuable advice and assistance in the course of the study.

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DISCUSSION

Edgar Bolling (Atlanta, Ga.): Chloromycetin has been available for use in the treatment of lymphogranuloma venereum at the Emery Medical School for only the past four months. Our patients, therefore, are few and observations have not been made long enough to offer conclusive facts. However, inasmuch as experimental data on this subject are meager, I feel justified in making a preliminary report of our impressions and observations to date and thus add our cases to the cases that have been reported by Dr. Rowe and help to evaluate the use of this drug.

Our experience with lymphogranuloma venereum is almost entirely confined to colored females seen in the proctology clinic in the Negro unit of Grady Hospital, the charity hospital in Atlanta and teaching hospital for Emory Medical School. Dr. Albert Heyman is in charge of the clinic for genito-infectious diseases and the treatment has been under his direction.

The amount of the drug we have had available was limited; therefore, I selected the patients in the proctology clinic who had rectal strictures or rectal involvement with acute evidence of the disease, eliminating many with chronic strictures who have been coming to the clinic for many years.

The first patient selected was a colored woman, age thirty-five, with a complaint of tenesmus and bloody mucous discharge from the rectum of three months' duration. On proctoscopic examination a moderate proctitis was present and a band-like stricture was felt 5 cm. above the pectinate line. (This is the diaphragmatic type referred to by Dr. Rowe.) The Frei test was positive. She was given chloromycetin in doses of 3 gm. daily for ten days. At the end of thirty days all symptoms of the disease—tenesmus and bloody mucous discharge—had disappeared. The stricture showed a definite regression, was pliable and soft, although fibrosis was still present.

The second patient was a colored female, thirty-three years of age, whom we saw in December, 1949, with massive abscesses of the buttocks and several draining sinuses. There was also an almost complete intestinal obstruction, caused by a rectal stricture which would not permit digital examination, and this was of the tubular type which Dr. Rowe mentioned. This patient was referred to the hospital for a colostomy for relief of the obstruction, after adequate drainage of the abscesses had been obtained. When the pain produced by the abscesses had been relieved, she refused colostomy and left the hospital. In the light of future developments this proved to be a wise decision on her part.

She returned to the proctology clinic with multiple fistulas, which were draining profusely, and there was a typical granulomatous infiltration of the rectal mucosa with stricture formation of the lower rectum. She was receiving sulfonamides when we received our supply of chloromycetin. She was then given 3 gm. of chloromycetin daily for ten days, and the purulent drainage decreased markedly. The granulomatous proctitis, so characteristic of lymphogranuloma venereum, has disappeared and the stricture has regressed.

Two other patients with strictures have been treated, both having positive Frei tests and both with typical lesions of lymphogranuloma venereum. The results have been quite impressive.

A fifth case presented a picture of an acute systemic disease with diarrhea of eight to ten stools daily, bloody mucous discharge, low grade fever, weakness and malaise. She had complete medical study on the medical service, including much laboratory work and many stool examinations. The only positive finding was a positive Frei test and positive complement fixation test. She had been treated with sulfonamides and penicillin with little change of her condition. She had a mild degree of proctitis in the ampulla, and an infiltrated nodular area could be felt in the rectal wall in the region of the middle valve. There was no stricture formation, but this nodular area was quite tender to palpation. She was given chloromycetin, 3 gm. daily for ten days, and her bowel movements became normal, being reduced to two or three times daily. The low grade fever disappeared, and the patient gained eight pounds while in the hospital. The tender mass that had been felt in the wall of the rectum disappeared. She is still being observed as an outpatient, but the therapeutic results were not as impressive as in the other four cases.

To summarize we are impressed with the quick clinical improvement in cases of lymphogranuloma

venereum treated with chloromycetin, with rectal involvement. Rectal involvement occurs, however, in only a small percentage of these cases. Dr. Rowe mentioned this observation in his original paper, but he did not have time to mention it this morning.

It is much too early to say whether the clinical improvement will be permanent or whether this drug actually attacks the virus of lymphogranuloma venereum or merely cleans up the secondary infection associated with it. Dr. Heyman reported in 1947 the effect of sulfonamide therapy on the persistence of the virus in buboes and, despite sufficient sulfathiazol to produce clinical recovery, he was still able to recover the virus in the inguinal nodes. We do welcome and heartily recommend chloromycetin as the best clinical agent we have used to date when we are confronted with these problem cases of rectal stricture due to lymphogranuloma venereum. I want to commend Dr. Rowe for his excellent study.

Tom Smith (Dallas, Tex.): About twenty-seven years ago Dr. Curtice Rosser started the lymphogranuloma venereum clinic at Parkland Hospital and, after trying many types of treatment, he came to the conclusion at that time that constant rectal irrigations, proctotomy and repeated dilatations afterwards, over a period of approximately a year, gave the best results.

By 1935 when I began work in the clinic Sir Hugh Devine had reported his transverse colon colostomy.

We decided to try the effect of rest on the strictured area as afforded by Devine's procedure. After fifteen cases we found our results disappointing because although the secondary infection cleared up there was a universal exacerbation and recurrence after the colostomies were obliterated and continuity re-established. I then returned to Dr. Rosser's outline of treatment.

In 1946 Dr. Rowe came along and with his usual enthusiasm approached this problem from a chemotherapeutic standpoint. We believe his observations of the healing effect of chloromycetin in the early stage of this disease are encouraging and stress the importance of early diagnosis.

We think Dr. Rowe is doing a grand job in conducting this clinic. In his observations we believe he is trying to be as scientific as humanly possible and that he is in the middle of the road in his reporting.

Michael W. Holehan (Memphis, Tenn.): Personally, I have not tried chloromycetin but for fourteen years we have had something like 400 or 500 lymphogranulomas. We found that the sulfa drugs helped them very much but we found that sulfa—and I am afraid this other drug, too—takes care of only the secondary infection.

A patient will come in with ten, fifteen or twenty stools a day, a temperature of 103°, 104° or 105°F., acutely sick, emaciated, dehydrated and with intravenouses of different kinds, sulfa drugs, even x-ray in four or five different ports over the pelvis, will clear up these secondary infections. The patient will get tremendously better, the strictures will subside—I do not mean that they will go away entirely—but a stricture that will hardly admit the finger, after sulfonamides, rest, intravenouses and x-ray, will easily admit the finger, and some of the ulcerations will clear up and the patient will have good stools.

There is something about this virucidal disease, however, that it comes back. In numerous abdomens that we have opened the sigmoid will be thickened, hard and edematous, showing that this disease has gone up the lymphatic route. We have finally come to the conclusion that regardless of whether or not it is a new case, just starting, we do, first, a single barrel colostomy, close off the distal loop and put it back into the abdomen; and when the secondary infection has cleared up and the patient has gained strength and the blood is up to normal, we do an abdominoperineal resection.

In these people whom we have seen in the clinic the histories have gone on for ten, twelve, fifteen or twenty years. They have been on charity for years. They gain 60, 80 or 90 pounds and they begin to be self-supporting, something they have not been for ten, fifteen or twenty years, and they again take a place in society.

I have enjoyed these papers very much and I hope we have something in this new drug, but I am afraid it is just for the secondary infection, which will eventually lead to resection.

Robert J. Rowe (closing): In closing I would like to emphasize the fact that there is still a great deal to be learned about lymphogranuloma venereum. For example, it has been theorized that perirectal lymphatic invasion of the virus-like agent from the genital lesions was responsible for the rectal manifestations of this disease. I am convinced that this is an erroneous conclusion since the disease has been produced experimentally in chimpanzees by Levaditi by direct implantation on the rectal mucous membrane. It is also observed in males who have admitted sodomy and I have seen a number of colored females who had had genital lesions but in whom any symptoms of rectal disease never developed. Neither do we know the period of time required for rectal strictures to develop after the initial infection occurs. Attention has been called to some of the systemic manifestations of lymphogranuloma venereum but, undoubtedly, these often go unrecognized. Wright and his co-workers have called attention to the high incidence of asymptomatic lymphogranuloma venereum in routine hospitalized patients. It is obvious then that the pathogenesis of lymphogranuloma venereum is not well defined and it remains the responsibility of those of us who frequently come in contact with

this disease to make and record more astute observations.

Dr. Smith is quite familiar with this work and realizes that I did not expect to see a marked regression of the strictures in these patients. As I stated previously one diaphragmatic stricture completely disappeared. This patient was pregnant during the treatment and whether this had any influence upon the subsequent healing I do not know. In several patients there was marked improvement in the size of the strictures. Immediate results are not remarkable in the advanced cases; but after prolonged administration of chloromycetin when adequate time had elapsed for healing to occur, the results are promising.

In reply to the last discussor I stated previously that the advantage of chloromycetin appears to be due to its specific action against the virus. So far as I know none of the other therapeutic agents which had been used previously in the treatment of lymphogranuloma venereum had any specific effect upon the virus-like agent.

IRRITABLE COLON

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THE incidence of gastrointestinal disorders in an urban community[1] is approximately 20 per cent of the total patients encountered, and of these only about 50 per cent are found to have structural lesions. While it is recognized that thorough examinations tend to reduce the number of functional diagnoses, Emery's findings, with those of many other workers, emphasize the importance of functional disease to the gastroenterologist and proctologist.

In medicine there are relatively few diseases with a single cause and a single cure. All of us in clinical practice and clinical teaching would find it convenient if such disorders were more the rule than the exception. It is becoming evident, however, that many factors are involved in the etiology of such relatively simple syndromes as the one commonly known as the irritable colon. This functional colopathy is commonly referred to as the unstable colon, the restless colon, the dyssynergic colon, and in the older literature as mucous or spastic colitis.

The irritable colon has been defined[2] as a hyperirritable, neuromuscular imbalance of the colon sufficiently severe to cause abdominal pain or distress. Most authorities agree that it is neurogenic in origin, characterized by secretion of mucus in the stools, accompanied with flatulence and localized or diffuse abdominal pain, irritability and spasticity of the colon and certain constitutional symptoms.

In a review of 1,000 consecutive cases of irritable colon at the Cleveland Clinic, Collins and Van Ordstrand[3] found that 302 operations had been performed on 204 of the patients prior to admission without relief of symptoms. Forty-five per cent were found to be habituated to the more common etiologic factors such as excessive roughage in the diet and the use of cathartics or irritating enemas. While the danger of making a careless diagnosis and overlooking some more serious organic diseases is recognized, Ralph C. Brown[4] has stated, "It is my conviction that failure to recognize functional bowel disorders constitutes the single greatest source of error in abdominal diagnosis." Val Dez[5] says, "Colonic dysfunction is the chief cause of abdominal pain or discomfort."

It has long been recognized that the irritable colon syndrome is not an inflammation and, therefore, is not a true colitis. That there is dysfunction with spasticity, hypermotility and excessive mucous production is self evident. But it is no longer necessary to argue whether it is altogether functional or organic since we now know that functional disturbances tend to create cellular organic changes which are in turn followed by structural alterations.

We may ask what it is that permits these functional disturbances in the first place, and we should be prepared to recognize that certain hereditary deficiencies in the nervous system similar to those which accompany migraine, the allergies, the epilepsies, undoubtedly predispose the susceptible person. It is possible that the deficiencies are in the colon structure itself. How else can we explain why certain families seem predisposed to irritable colon, some to migraine, some to hypertensive conditions, some to the cerebral dysrhythmias and some to specific allergies?

The symptoms of irritable colon usually appear before or shortly after the age of twenty, a period of marked emotional stress and adjustment. While it is not totally disabling, the resulting incapacity and suffering experienced by some individuals all of their adult life points up the importance of this disorder. It is a complaint which affects four to five women to every man.

The victim of the irritable colon seldom appears for medical study in the first stages of the complaint. He may attribute his symptoms to dietary indiscretion, food poisoning, an acute illness or an emotional experience. In these early episodes it is sometimes possible to demonstrate the disequilibrium in the sympathetic and parasympathetic nervous system control of the colon. Acute emotional upsets, adjustment problems, intense fear and guilt complexes, experiences associated with feelings of inadequacy may precipitate the abdominal pain, flatulence, diarrhea, constipation and the mucus which be-

comes the most conspicuous sign in successive attacks.

This group of patients often has certain personality characteristics in common. The typical sufferer is the more serious, conscientious, introspective, worrisome, anxious, tense type of individual. It is not uncommon to obtain a history of a number in the family similarly affected and/or with similar personality traits. While heredity cannot be ignored, environment is important, and the incidence of the disease is greater in urban communities. There is also the factor of training, and the early toilet training habits of the individual undoubtedly predispose and may in some instances be the most important influence of all.

You may think that I am placing too much emphasis on the psychologic factors, but this is because my main purpose is to discuss the psychotherapeutic opportunities of the gastroenterologist in treating this group of individuals. I am not ignoring the causative role of dietary, nutritional, allergic, infectious and other agents. Nor am I unaware that the problem is particularly difficult, diagnostically and therapeutically, when two or more of these factors coexist.

For the purpose of our discussion I shall largely confine myself to the irritable colon as a colonic neurosis. As Alvarez has said, "The colon is a sounding board for the emotions or psychic disturbances." Our present day civilization with its strains and tensions, its conflicts and disappointments creates the struggle between the individual and his environment with resulting frustration or defeat. The resulting psychic phenomenon may be fear, anxiety, worry or just psychic tension. But this in turn must find some expression and one of the most common organ outlets for this overflow of nervous energy is the bowel.

Clinical experience indicates that this disordered function of the colon may occur from almost any adverse life situation which results in emotional conflict. The resulting psychic state is followed by somatic symptoms, and these in turn produce additional anxiety as the patient discovers the mucus and begins the rounds of doctors. An almost continuous round of reciprocal emotional and somatic factors may be produced, each made worse by the other. The diagnosis presupposes exclusion of all possible organic causes by a thorough investigation including painstaking history, physical examination, search for parasites and ova, proctoscopic examination of the terminal part of the large intestine, barium enema to exclude true colitis, tumor, other x-ray and laboratory studies, and special procedures where indicated.

In outlining treatment I shall again assume that we are dealing primarily with a neurosis of the colon. We have a hypertonic, irritable colon with vasomotor instability in a tense, hypersensitive, conscientious individual. This individual has acquired faulty habits of reacting and probably faulty diet and constipation as well. Whatever compensatory mechanisms the individual has used have at the moment of the acute symptoms failed him or her, and we might say that the patient has decompensated. The irritable colon has probably become irritated and painful, and the resulting discomfort and the show of mucus has produced fear and intense anxiety in an endless procession of psychic and physical factors.

The first objective in treatment is to give the patient relief. For some this may be sedation, for others physical medicine in the form of hot packs. Dietary restrictions and rest are often helpful, and a change of environment may seem necessary. The antispasmodics and protective colloids have their place.

However, my chief concern is to interest you, as you must interest your patient, in the role played by the often seemingly dissociated general life problems of the individual. It is necessary first of all to become acquainted with his or her entire struggle for existence. This need not be done at once or at one interview; but to be most helpful the physician must persuade the patient to talk about himself as a person. It is a time-consuming form of therapy, but it is one which pays excellent dividends in long term therapeutic results. It is not necessary to go into every detail of every life situation, for once confidence is established and the patient is free to talk about the things which are closest to his heart, most individuals find it easy to express their desires, ambitions, their frustrations and secret guilt, their disappointments over their choice of a career, their financial problems, their sexual adjustments and their religious conflicts.

Psychotherapy is a personal procedure. It requires the closest interpersonal relationship between a patient and his physician. In essence it is a simple and direct understanding, and as Peabody once said, the first thing in the care of

the patient is that the doctor must care for the patient. This is particularly true in dealing with the neurotic who always feels neglected even though he may blame himself.

The successful psychotherapist must be a good listener in addition to being sympathetic and understanding. He must recognize that the patient who is neurotic is also unstable or inadequate or at least believes that he is. For this reason a strong, authoritative or fatherly attitude is apt to inspire confidence and make the recommendation of a more constructive program for living more acceptable. Since no one likes to be told that his symptoms are his own fault, or at least in part attributable to his way of life, it is to be expected that some resistance and resentment will be encountered. No one wants to lay bare the secrets of his heart or to have his affairs pried into, not at least until a good reason for doing so has appeared and until rapport has been established with the physician. For this reason symptomatic treatment and some relief of the symptoms should be attempted first.

It is always wise to inquire into the previous treatment and to discover the patient's own estimate of the benefits, if any, which he has received. The patient with an irritable colon has frequently made the rounds of the cultists and has tried everything from colonic irrigation to faith healers. He has often been through one of the larger clinics and has heard many explanations of his complaints. Quite often he will tell you that he obtained the most relief from some cultist in whom he was fortunate enough to find an understanding spirit interested in his problem; a person who was patient, sympathetic, willing to listen to his troubles and perhaps even to suggest solutions. If so, whatever we might think of the cultist's methods, we must admit that he was practicing successful psychotherapy and we must emulate him if we are to be equally successful in the treatment of the patient with the irritable colon.

But psychotherapy is more than listening to the patient, being sympathetic and understanding, and merely practicing the art of medicine. Real psychotherapy involves understanding and treating the patient and his problem in the light of his entire life situation. The therapist must know what he is doing. He must understand that the individual is reacting to frustrations of his life situation and that these are in part reflected in a derangement of the colon.

What is more important, the physician should realize that the patient, while perhaps unable to sense his own situation and react sensibly to it, is quite sensitive to the attitudes expressed and unexpressed on the part of his physician.

The doctor who feels irritated by and contemptuous of the patient whom he regards as emotionally immature, constitutionally inadequate and deficient in desirable character traits, unconsciously conveys this attitude to the patient. The importance of the physician's attitude is thus of vital importance in treatment. It is not always necessary that the physician be kindly and sympathetic. Sometimes the desire to get well is prompted in the patient by the wish to show the doctor that he can get well in spite of treatment.

As physicians we should recognize that our patients regard us as parent substitutes to some degree; and that when there is a free choice of physicians, patients often seek out the doctor who reminds them of their favorite parent. It may be the positive, aggressive attitude of a dominant parent or the somewhat passive, solicitous attitude of one who "kissed the wound" and made serious the care of trifling injuries. To some physician-patient relationship is an opportunity to relive their early infantile dependent attitude of faith, trust and confidence. As a result the scene is set for the patient to feel slighted, offended or hurt by the physician's irritation, brusqueness or lack of interest.

Since the patient with the irritable colon is more often than not a neurotic personality, he is somewhat dependent and is looking for someone in whom he can trust. To inspire trust and confidence the physician must have confidence and hope to give the patient. He needs to resolve his own morbid doubts and anxieties about the outcome of treatment since the sensitive neurotic will recognize a doctor's hesitancies, his tensions and indecisions, and will interpret them to his own disadvantage. It follows that to be a good therapist one ought to have a pretty good understanding of himself. Sometimes the physician is prejudiced against the neurotic patient because of his own early experience with a neurotic mother or grandmother.

I hope I have not made psychotherapy sound so difficult that you will interpret my remarks as an invitation to refer the patient to a psy-

chiatrist. On the contrary, a patient with an irritable colon almost invariably resents this suggestion. At the beginning of treatment and after you have investigated the patient as a whole and learned all about him, it will be unnecessary to refer him. What you need to do is to borrow the psychiatrist's methods of inquiring into what makes the patient react as he does, what he is reacting to, and why. In giving him an opportunity to vocalize instead of repressing his feelings one has taken a big step in treatment of functional disorders.

In explaining to the patient the nature of a functional disorder it is important to this group to distinguish between ulcerative colitis and the irritable bowel. Thereafter avoid the word colitis altogether. To explain that the individual's bowel is essentially normal but oversensitive is made more acceptable by using simple analogies. For example, some people with essentially normal eyes have to wear dark glasses in the California sunlight. Other illustrations can be used such as pallor or fainting at the sight of blood, and this offers an opportunity to explode some of the fears and peculiar beliefs which the patient has accumulated in making the rounds of healers. It is helpful to explain the simple physiology of the colon, how it takes two to four days normally for the food to make the trip through the digestive system. I try to give them clinical information intended to make them less bowel conscious and to tell them as Sir James Goodhart did to "do as the dog does and never look behind."

Since the patient resents being told that there is nothing wrong with him, and rightly so, it is important to avoid conveying the impression that it is "all in your mind." I have found it helpful to remind the patient that the nervous system weighs more than any other organ of the body; and that when it is made sensitive or irritable, it may produce a multitude of uncomfortable but not serious symptoms, including nervous headaches and the irritable colon. It is well to stress the part that fear and lack of security produce in the patient.

Of course the patient needs to be advised about food tolerance and the benefits of diet. Due stress should be laid upon environmental conditions such as irregular habits and the use of laxatives and enemas. However, all through this we should be searching out the underlying and precipitating factors in the personal, social and economic life of the patient, from which originate and radiate the nerve impulses which cause the irritable bowel.

We must be aware of the fact that these patients, whom we sometimes thoughtlessly describe as inadequate or constitutionally inferior, are too often aware and sensitive of this fact. In spite of the implications of the name it is too often true that they are suffering not from a hereditary or organic defect but from a larger defect in their training or a lack of any persistent effort on their part to develop a more stable control of their emotional tendencies. As a part of the treatment, therefore, the physician must constantly hold before the patient the need for neutralizing his symptoms and complaints by continuous discipline and a personal effort for a more comfortable, acceptable and adequate way of life. These changes in the personality habits in the direction of a more mature and adult attitude cannot be imposed from without. They must result from the individual's own personal efforts.

Our own understanding of the psychophysiologic processes involved in the colopathic or any organ neurosis should include the recognition that there is a close relationship but an important difference between such physiologic conditions as weeping, laughing and blushing, and the responses to the emotions in such organs as the colon. When an individual weeps he can usually give the reasons for his weeping even though it is delayed and repressed for a time. In the organ neurosis, however, the origin of the emotion responsible for the colon symptoms has been lost, and the patient himself does not even realize that there is such a relationship. In fact he may and probably will deny it, and too often he will be supported in his opinion by the attending physician.

What we must appreciate is that psychic and emotional tension which finds its way of expression blocked through the more normal channels is not a full and complete expression or relief of psychic tension such as we expect to find in weeping, laughing, anger or sex. While it produces a certain degree of relief of psychic tension, the chronic dysfunction of the colon also sets up a variety of new tensions and new anxieties such as concern over the mucus and the expense of treatment so that the physician must, whether he likes it or not, make himself the father-confessor and willing to approach the patient from the standpoint of the whole man.

In conclusion the work of Wolf and Wolff, Almy and Grace no longer leaves any doubt that hyperfunction of the colon manifested by hyperemia, engorgement, hypermotility, hypersecretion of mucus and increased fragility of the colonic mucosa, result from such feeling states as anger and resentment. Sustained feelings of anger and resentment are associated with sustained hyperfunction of the colon and result in submucosal bleeding and ulceration. These significant clinical observations and experiments are taking the guesswork out of gastrointestinal medicine. They leave no doubt but what the successful gastroenterologist and proctologist of the future will be those who include in their diagnosis and treatment of the patient an estimation of the constitutional makeup of the patient and an evaluation of his struggle with and his adjustment to his environment.

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HYDROGEN PEROXIDE PROCTITIS

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FOR many years solutions of hydrogen peroxide used as enemas have been known and recommended as an effectual means of emptying the lower bowel, especially in the presence of impaction. The potential dangers of this modality are apparently not so well known. This is evidenced by the fact that authors sometimes suggest strong solutions for this purpose and practicing physicians often instruct their patients in a similar fashion. This has resulted in not a few cases of proctitis due to the irritant effect of the peroxide. While hydrogen peroxide in proper dilution is apparently harmless and deserves a place in our armamentarium, the injudicious use of peroxide solutions will often result in a great deal of harm. Although most cases of peroxide proctitis subside promptly and satisfactorily, an occasional case can be the source of a great deal of disability and may take months to heal.

Buie[1] has warned against the use of strong solutions of hydrogen peroxide and has recommended the use of 30 cc. (1 ounce) of U. S. P. hydrogen peroxide solution to 500 cc. (1 pint) of water. Benson and Bargen[2] suggested that only a 1 to 1.5 per cent solution of hydrogen peroxide be used and warned that with stronger solutions proctitis might develop, the treatment of which might require many days. This represents a much weaker solution than is ordinarily advised. The question has been discussed,[3] and a weak peroxide solution was advised in the treatment of impaction. The reader was warned against the possible dangers of peroxide proctitis. The dilution suggested was one part hydrogen peroxide to three or four parts water. Hirschman[4] recommended one part hydrogen peroxide to two or three parts water and thought that this solution was definitely superior as a means of correcting impaction. Others have recommended stronger solutions. Rainey[5] suggested a 50 per cent solution of hydrogen peroxide and water as an effective means of correcting an impaction. In other textbooks a 50 per cent solution of hydrogen peroxide has been recommended without expressing much in the way of caution.

The Pharmacopoeia of the United States describes liquor hydrogenii peroxidi as an aqueous solution containing in each 100 cc. not less than 2.5 gm. and not more than 3.5 gm. of H_2O_2. As commonly sold by druggists the solutions average around 3 per cent, although other strengths are available. Liquor hydrogenii peroxidi fortior is an 8 per cent solution, and other preparations offered as mouth washes and bleaching reagents have strengths of 12 to 20 per cent.

Hydrogen peroxide tends to break down very rapidly into water and oxygen on contact with oxidizing or reducing agents. As an enema the fresh solution apparently acts because of the rapid liberation of oxygen which tends to oxidize and break up the impaction. Because of the rapid liberation of gas a strong peristaltic reflex is set up. This oxidation also affects the mucosa and in stronger solutions has a caustic action. Cushny[6] states that a concentrated solution corrodes the skin, leaving a white eschar. Bastedo[7] used a peroxide solution in the colon to check the growth of anaerobic bacteria but found that in effective strength it proved too irritating to the bowel. Thus it appears that solutions of hydrogen peroxide used as enemas may have quite undesirable effects and may be the cause of serious disability. This concept has been fully justified in practice since on numerous occasions we have been called in consultation to ascertain the cause of the patient's disability.

The diagnosis of peroxide proctitis is made primarily on the basis of a history of using strong peroxide solutions to relieve an impaction and is confirmed by the findings on sigmoidoscopic examination. The symptoms include tenesmus, frequent rectal discharges consisting largely of bloody mucus and a constant bearing down pain.

In its early stages the sigmoidoscopic findings are characteristic and can scarcely be mistaken for another pathologic process. The greatest activity is found in the lower rectum, the process tending to diminish as the more proximal segments of the rectum and colon are observed. The mucosa in the areas of most intense in-

volvement is completely covered by a tenacious, gangrenous, yellowish gray membrane which gradually assumes a patchy distribution as the upper reaches of the process are observed. These patchy areas have a puckered appearance and most nearly resemble a wart that has been treated by an acid. The islands of intervening mucosa have a pale, edematous appearance. The process usually involves only the lower rectum, but it may involve the bowel as far as it is possible to examine it. Later, the gangrenous areas begin to slough, and in severe cases the entire mucous lining of the lower bowel may be lost. This is followed by a stage of repair in which the bowel presents a friable, granular appearance not unlike that seen in severe chronic ulcerative colitis. The process tends to be more severe on the valves of Houston and in the lower rectum. Depending on the severity of the slough, some narrowing of the lumen of the bowel may result as permanent scarring occurs. In some cases excessive proliferation of granulation tissue has been a late sequella and one that has occasioned a marked delay in healing. The healing process may be either prompt or delayed over a period of weeks to months. In our more recent cases of patients treated with the sulfonamides and antibiotics healing has seemed to occur more quickly and completely than those seen in former years. I will describe two cases that best illustrate the aforementioned features.

Case I. This fifty year old white female was first seen July 18, 1940. She had been on a Sippy regimen for peptic ulcer and six days previously fecal impaction had developed. The patient was advised to take peroxide enemas at home, using half peroxide solution and half water. She was unable to eliminate the impaction and was hospitalized four days before we were consulted. On admission the impaction was broken up manually and repeated peroxide enemas administered. The solution used consisted of two parts peroxide and one part water, a quart of this solution being used each time. She was finally relieved of the impaction but subsequently generalized abdominal soreness developed, severe tenesmus and passage of bloody mucus.

On examination a severely ill patient in obvious pain was seen with an oral temperature of 103°F. Sigmoidoscopic examination showed a severe ulcerative proctosigmoiditis beginning just above the dentate line and extending as far as the instrument could be inserted—a distance of 24 cm. The mucosa of the bowel had a hobnailed appearance, with multiple islands of mucous membrane covered with a gray, tenacious membrane and surrounded by ulceration. Edema was marked, and there was a considerable amount of purulent exudate present in the lumen of the bowel. She was given sedation, hot wet abdominal packs to the abdomen, mineral oil and bland rectal irrigations. She continued to have a stormy course with marked abdominal pain, especially in the left lower quadrant, and daily temperature elevations to 101°F. Five days after the first examination she was again sigmoidoscoped. The mucosa in the sigmoid was found to be reacting fairly well in that some healing appeared to be taking place. However, the lower third of the rectum was completely encircled by a gray slough which appeared to become thicker and more extensive as the anus was approached. Two weeks later the slough had almost completely separated, and the bowel had a friable, granular appearance with a tendency to piling up of granulation tissue in some areas. Five weeks after the original examination the process was healed save for an extensive area of granulation tissue on the left rectal wall. This area persisted and was repeatedly cauterized with silver nitrate and fulgurated. The process finally healed completely eight months after onset.

Case II. This seventy-six year old white female first presented herself on August 28, 1949, with the history of chronic constipation extending over many years. Because of supposed stomach and gallbladder disease the patient had subsisted during the preceding year on a diet limited to milk and very soft foods. Impaction developed with which she struggled for several days before using an enema of full strength U. S. P. hydrogen peroxide solution. The impaction was successfully relieved, but after the peroxide enema constant tenesmus and pain developed. She had multiple discharges consisting of bloody mucus and flecks of stool, occurring about every thirty to sixty minutes, day and night. On examination a diffuse ulcerative proctosigmoiditis could be seen extending to the limit of sigmoidoscopy—a distance of 24 cm. A large area of severe ulceration was noted on the posterior wall of the bowel 16 cm. above the anus. The patient was given 1 gm. of sulfathaladine four times daily, rectal instillations of warm oil and one teaspoon of hydrocil* by mouth twice daily. The process gradually subsided so that at the end of three weeks nothing could be seen of the proctitis save congestion of the mucosa.

In both of these patients stool tests were negative for ova and parasites. Stool cultures for the dysentery group were negative. The urinalyses, blood counts and blood chemistries,

* Bulk product of Fuller Pharmaceutical Company, Minneapolis, Minn.

including sugar, non-protein nitrogen and creatinine, were within normal limits. X-ray examinations of the colon which were made after the process had subsided showed no pathologic disorder in any case. The progress of both patients has been satisfactory to date.

SUMMARY

There is no doubt that enemas using hydrogen peroxide solutions are effective in relieving fecal impactions. It is apparent, however, that the strength of the solutions used must be closely supervised in order to avoid complications. In my experience no more than 30 cc. (1 ounce) or at most 60 cc. (2 ounces) of a U. S. P. solution of hydrogen peroxide (3 per cent) to 500 cc. (1 pint) of water should be used. It should also be taken into consideration that varying strengths of hydrogen peroxide are available on the shelves of druggists.

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DISCUSSION

James M. McIntyre (Indianapolis, Ind.): Dr. Pumphrey's paper is of interest and importance because of the disability sometimes produced by the use of hydrogen peroxide enemas in removing fecal impactions. In the past five years Dr. Ricketts and I have seen three patients experience difficulty following the use of hydrogen peroxide enemas. The first patient was not disabled, experienced only mild abdominal pain for an hour or two following the enema and did not develop proctitis. The other two patients were of necessity hospitalized, and their symptoms and signs, including the appearance of the rectum on sigmoidoscopy, were exactly the same as those of the two patients just described by Dr. Pumphrey.

They both improved satisfactorily following the use of sulfasuxadine, phenobarbital and belladonna, mucilose and daily mineral oil instillations. One of these patients was hospitalized for one week and then seen in the office at weekly intervals for two months, at which time her rectum and lower sigmoid appeared normal.

The second patient was hospitalized for two weeks and moderate inflammatory contracture developed 9 cm. from the anus. She was also seen in the office at frequent intervals, and three months after leaving the hospital the rectum on sigmoidoscopy was normal with the exception of a very mild asymptomatic contracture 9 cm. from the anus.

The important thing to be considered is the possibility of a perforation, especially in a patient with diverticulosis or diverticulitis. However, of less importance is the fact that the treatment may be worse than the disease, from the standpoint of distress to the patient, and the financial embarrassment incident to the hospitalization and treatment.

For these reasons we no longer use or advocate the use of hydrogen peroxide enemas. We believe that fecal impactions can be treated satisfactorily by the use of oil instillations, enemas of petrolagar and water or milk and molasses.

C. E. Howard (Cincinnati, O.): I wish to recommend for your consideration a very simple mixture which I have used for about twenty-five years, with very gratifying results and no untoward incidents.

I have on hand at all times a mixture of powdered tragacanth and water. This is about the consistency of cold molasses. Patients with fecal impaction are laid upon the table and 2 or 3 ounces of this mixture is injected. Then the patient is permitted to lie down on the couch and wait. After an hour or so he is given a plain water enema. It is surprising how rapidly, thoroughly and satisfactorily this mixture will break up an impaction.

If one is in a hurry, instill the mixture, wait ten or fifteen minutes, catch the mass between the hollow of the sacrum and your finger and it will break up rapidly. Follow this with an enema. It may be necessary to repeat this performance once or twice. I assure you I have never had any bad results from it.

USE OF SLIDING GRAFTS IN THE TREATMENT OF ANAL FISSURES*

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AN anal fissure, fissure-in-ano, may be defined as an infected, elongated sore in the anal canal. It has a strong tendency to chronicity and is usually located in the posterior or anterior commissure and, rarely, laterally. The fissure is always radial to the canal and is external to the anorectal line. It is the most frequent cause of pain accompanying and following bowel movements.

The use of sliding grafts in the treatment of anal wounds is not a new idea. Carmel described the use of sliding grafts in his paper on surgical treatment of hemorrhoids at the annual meeting of the American Proctologic Society in 1947.[1]

This report covers a series of 110 consecutive operations for fissure in which sliding grafts were used to cover the excised fissure bed. Spinal anesthesia, 10 mg. of pontocaine in the fourth lumbar interspace, was uniformly used. The patients were operated upon in the inverted position and according to the following technic: After careful cleansing of the anal area, a Smith anoscope is inserted in the anal canal, exposing the fissure. An incision is made with a sharp knife parallel to and on each side of the fissure, cutting the anal skin, the subcutaneous tissue and fibers of the corrugator cutis ani muscle from the anorectal line to the outer margin of the sentinel pile of Brodie. A third incision is made joining these two radial incisions at the outer margin of the sentinel pile of Brodie. The fissure thus outlined is then freed from the underlying muscle, beginning externally and continuing to the anorectal line. Just inside the anorectal line this triangular tissue containing the fissure is cut free from the mucosa. (Fig. 1.) Care is taken to remove (1) practically all of the skin covering the sentinel pile, (2) all associated scar tissue and fibrosed fibers of the corrugator cutis ani muscle forming the lateral wall of the fissure, (3) all associated anal papillae, (4) associated anal glands and crypts, and (5) hemorrhoids in the vicinity of the fissure.

After the fissure is thus excised, adequate drainage is established by cutting the subcutaneous external sphincter muscle and the intermuscular septum, completely or in part, so as to remove any transverse bar that might interfere with drainage. This drainage incision is made on the medial side of the wound.

A triangular area of skin (Fig. 2) about 1 inch in length and varying in width with the width of the excised fissure bed is completely circumscribed with a sharp knife just external and radial to the fissure bed. The blunt end of the inner margin of this triangle is formed by the outer margin of the excised fissure wound. This triangular piece of skin is used as the sliding graft. The graft is mobilized all around its circumference so that it can be slipped into the anal canal as far as the anorectal line and still be attached to its own subcutaneous tissue.

In mobilizing the graft it was found to be essential to sever completely the fibers of the corrugator cutis ani muscle on each side of the graft and to preserve an adequate thickness of subcutaneous tissue at the apex of the graft in order to insure a good blood supply. The graft is taken either from the right or left of the midline but never from the midline itself. It is slipped into the anal canal and sutured (Fig. 3) to the mucosa with chromic No. 000 catgut on an atraumatic needle, catching a few fibers of the internal sphincter muscle.

The first suture is inserted in the right inner margin of the wound through the mucosa, the muscle and the graft; the second is placed in the left inner margin of the wound, catching the mucosa, the muscle and the graft. The third suture is placed at the midline of the sliding graft, through graft and mucosa, thus preventing gapping between the loose mucosa and the graft. All are simple through-and-through sutures. Care must be taken to avoid undermining

* From the Department of Proctology, Thomas D. Dee Memorial Hospital, Ogden, Utah.

the subcutaneous tissue at the inner portion of the graft. After the graft is placed, if any tension is present, deeper lateral cuts are made on each side of the graft and at the distal end for better mobilization. Occasionally this may produce a rolling inward and upward of the distal margin of the graft, and a small suture may be used to pull the skin margin down toward the subcutaneous tissue, making sure that this produces no tension on the graft. Adequate drainage is established on each side of the sliding graft extending well out into the donor site. (Fig. 4.)

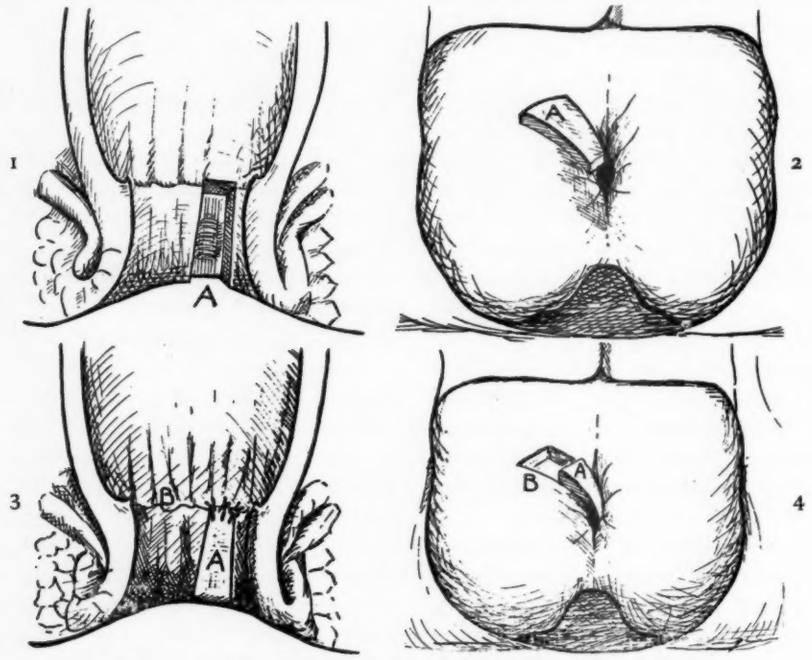

FIG. 1. A, fissure and associated pathologic disorder entirely excised.
FIG. 2. A, sliding graft completely mobilized.
FIG. 3. A, sliding graft brought into excised fissure bed and sutured to the mucosa catching a few fibers of the sphincter muscle; B, mucosa.
FIG. 4. Exterior view of graft after being sutured to the mucosa; A, sliding graft; B, donor site.

In this series the anal wounds healed in an average of ten days, whereas it required twenty to thirty days for epithelium to cover the donor site.

The following complications were seen postoperatively: (1) sloughing of the inner portion of the sliding graft, (2) formation of an ulcer between the apex of the graft and the mucosa, (3) delayed healing due to overlapping of the anal skin and (4) formation of a granuloma in the donor site.

In two cases the inner third of the sliding graft sloughed. This became apparent on the fourth postoperative day and was due to an impaired blood supply. In one of these cases sloughing occurred because of insufficient subcutaneous tissue at the apical portion of the graft; in the other case it was due to excessive tension on the apical portion.

An ulcer formed between the apex of the graft and the mucosa in three cases. This was not due to sloughing of the graft itself but to retraction of the mucosa away from the graft. In one case this was the result of inadequate suturing of the mucosa to the graft. In the other two cases a suture became untied, thus allowing the mucosa to retract. In the instances in which this developed the ulcer gradually filled in without undermining.

Delayed healing due to overlapping of the skin on to the surface of the graft occurred in two cases. One was due to failure to remove enough of the subcutaneous tissue from the margins of the adjacent skin, thereby preventing the skin margin from coming into close approximation with the margin of the graft. In the other case it was due to edema of the adjacent skin, resulting in an infolding of the latter onto the surface of the graft.

Formation of an infectious granuloma in the donor site occurred in one case. It was necessary to excise this granuloma on the twenty-fifth postoperative day.

Infection under the graft did not occur in a single case and should not if adequate drainage on each side of the graft is established.

In this series of 110 cases multiple sliding grafts were used in ten. In six a graft was placed in the midline anteriorly as well as the midline posteriorly. In four the area of excision in the posterior quadrant of the anus was so large that it was necessary to bring a sliding graft from the right posterior quadrant as well as the left posterior quadrant. Uniformly good results were obtained except in the two cases in which sloughing occurred. Even in these the area healed in about one month's time without the formation of excessive scar tissue or stenosis of the anal canal.

SUMMARY

In this series of 110 consecutive cases of patients with anal fissure treated with means of sliding grafts, there were no recurrences. Uniformly good results were obtained. This procedure proved especially beneficial in fissures resulting from postoperative anal wounds. Very little postoperative discomfort occurred.

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DISCUSSION

Edward F. Sladek (Traverse City, Mich.): Fissure-in-ano is supposedly a very simple pathologic condition, a crack in the mucosa of the anal canal, and consequently should be easy to treat. Unfortunately, the physiologic defense mechanism of the body, sphincter spasm and efforts to combat infection prevent the obvious simple measures directed toward the cure of fissure. From time immemorial sphincter spasm and infection have been recognized as definite factors in this condition. The common practice of the profession has been to divulse the sphincter and cauterize the fissure base. We know that this procedure does not usually work. Physiologic and pathologic conditions have been ignored.

The role of the proctologist is to pay greater attention to details. Dr. Belnap describes a method of treatment for fissure-in-ano which is the ultimate in attention to details. He performs a good operation; he excises the entire fissure and its base and he removes all associated pathologic conditions. He is meticulous in assuring good drainage of the operative site, and he attempts to insure physiologic rest by a partial sphincterotomy. He then complicates his surgery in an attempt to shorten the postoperative pain and healing time by a slip graft of skin to cover the operative area. To do this requires suturing, and suturing itself sometimes causes considerable postoperative pain. He admits that occasionally his graft does not completely take and an indolent ulcer results which requires time to heal.

To me, fissure-in-ano is only a symptom or complication of a pathologic condition of the anal canal or a disturbed constitution. First, all pathologic disorder of the anal canal must be corrected. Secondly, the entire fissure must be excised and adequate drainage of the wound established. Thirdly, the vicious cycle, the sphincter spasm and the habit syndrome must be interrupted. Partial or total posterior sphincterotomy plus the perianal injection of an adequate amount of long-lasting anesthetic will accomplish this. Attention to the details in frequent postoperative care materially assists in a rapid, painless healing process.

There are many other factors involved in the rapid healing of anal fissure which must be considered. Research at the University of Michigan concludes that there are no effective stimulating agents toward wound-healing. Delay in the rate of wound-healing is affected by (1) tissue necrosis due to trauma, rough handling or a deficient blood supply, (2) infection, (3) hematoma due to bleeding vessels or the ooze of a chronic vitamin K deficiency and (4) foreign bodies, as chemical antiseptics, certain ointments, talc, mass ligation of tissue and poor technic. In addition, a number of general factors affect the rate of wound-healing, namely, the age of the patient; general disease conditions, particularly anemia; water and electrolyte balance; nutrition, with special emphasis on protein and carbohydrate metabolism; and vitamin intake, especially vitamin A for epithelization and C for the production of the so-called "cement" substance. There has been much recent speculation as to the role of the adrenocortical sterones in wound-healing. It is possible that within the near future we will have some drug which will materially assist our patients in rapid recuperation from surgery. To do a good job, even in such a simple condition as fissure-in-ano, we as proctologists must evaluate the whole patient.

A. G. Carmel (Cincinnati, O.): When Dr. Belnap wrote me that he had prepared this article and sent me a copy, I derived a great deal of pleasure from the fact that he was using a sliding graft, as I had originally termed it, in fissures. My experiences with our editorial board have made me much more selective in the choice of words. I found

myself objecting to the needless introduction of an additional term when we now have a sufficient number which seem to fit the picture better. The illustrations that have been shown are clear and instructive; the technic follows the method which I described in 1947, 1948 and 1949.

Now, with regard to infection I would like to come to the defense of Dr. Belnap. In an experience with hundreds of cases that included fissurectomies, hemorrhoidectomies and contracted anal canals sliding grafts have been successfully used. However, I do not recall a single instance of infection at the site of the graft. The method seems to have a wide range of applicability in anorectal surgery. However, it is not sound surgical practice to use it when the area to be covered is actively infected or presents an unhealthy granulating surface.

I believe Dr. Belnap has rendered us a service by adding his experience with the use of the sliding graft to what we have already had.

CONTRACTED ANAL CANAL

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THE anal canal, too small to permit normal bowel function, is frequently seen in the proctologist's office. However, when searching for an authoritative discussion of the subject, one is struck by the paucity of information on the subject in textbooks and the current literature.

Apparently no attempt has been made to establish a criterion to determine whether the anal canal can function in a normal manner. It is known, however, that one finger may usually be inserted into the canal without causing discomfort although considerable distortion is present. On the other hand, two fingers inserted at the same time usually cause distress even though there is no pathologic limitation to expansion of the sphincter. Obviously the exact diagnosis must depend, therefore, upon a careful history and examination after adequate anesthesia is obtained.

The following three general types of contraction may be recognized: The first is the one in which only a limited segment of the anal canal is involved. Here there is an inelastic hymen-like band of scar tissue with a central perforation. The second is the one in which a considerable portion or all of the anal canal is lined with scar tissue and as a consequence cannot expand in a normal manner. The third is the one in which tissues surrounding the anal canal are interrupted or infiltrated by inelastic fibers and bands which effectively prevent normal function of the sphincter and progressively reduce the diameter of the lumen of the canal as further contraction takes place.

Contraction of types 1[1] and 2 usually follows anorectal surgery. A discussion of the diagnosis and treatment of these two entities is the principal subject of this article. Other than to mention progressive granulomatosis, a discussion of the causes and treatment of contraction type 3, lies beyond the province of this paper.

In that portion of the canal which is involved the epithelial lining with its elastic fibers is completely replaced by inelastic scar tissue. The underlying muscle fibers of the sphincter apparatus are not affected and fail to function simply because the overlying tissue is not elastic.

Regarding symptoms, pain following operation, increasing constipation and a sensation that the anal canal is too small are pathognomonic. Table 1 illustrates how constant these complaints are.

TABLE 1

Patients	Previous Operation	Pain	Constipation	Small Anal Canal
D. D.	+	+	+	+
D. P.	+	Slight	+	+
A. M. S.	+	+	o	+
M. R. D.	+	+	+	+
A. F. C.	+	+	+	+
H. C. J.	+	+	+	+
M. L. G.	+	+	+	+
P. H. T.	+	+	o	+

Differential diagnosis is not difficult. When a patient states after operation that the anal canal seems small, we must not depreciate his complaint.

Conditions to be differentiated are the following: untreated fissure, unhealed hemorrhoidal remnants, ulceration, abscess, foreign body, tumor of the anal canal, pectenosis,[2] coccygodynia and spastic sphincter. Untreated fissure, unhealed hemorrhoidal remnants and ulceration usually accompany contracted anal canal following surgery and are often an evidence of incomplete diagnosis and faulty surgical technic. Abscess, foreign body and tumor are visible or palpable. A positive Frei test indicates lymphogranuloma venereum and biopsy may indirectly confirm that diagnosis.

Pectenosis is characterized by indefinite discomfort, a sensation of fullness in the rectum and the feeling that defecation is incomplete. Demonstrable pathologic disorder may be absent except for a real or apparent elongation of the anal canal. At the time of operation the entire anal canal retenses[3] with difficulty although adequate anesthesia is present. A properly performed pectenotomy exposes a transverse band

of fibrous tissue just beneath the normal anal lining of the pecten.[4] When this band is severed, relaxation follows immediately.

Pathologically, severe and long-standing coccygodynia is characterized by an apparent or real increase in diameter and decrease in elasticity of the anorectal bundle, which is normally the thickest and best defined portion of the anorectal ring. More definitely, the anorectal bundle is a term which may be used to identify the posterior half of the anorectal ring which is formed by the puborectalis portion of the pubococcygeus. When the index finger in the rectum is curved toward the coccyx and withdrawn from the anal canal, the anorectal bundle is found to be tense and unyielding and gives the same sensation as would be experienced if a piece of bone covered with mucous membrane were lodged firmly across the posterior quadrant of the lower rectum. Treatment, so far unsatisfactory, will be discussed in a subsequent paper.

Uncomplicated spastic sphincter seldom occurs; constipation is the principal symptom and cure may be expected following adequate retension. It should be understood, of course, that previous surgery and the presence of concomitant pathologic disorder of whatever nature may confuse the picture and present the surgeon with a difficult problem in diagnosis.

The treatment of contracted anal canal is as follows: It will often be necessary to wait until the patient is under anesthesia before determining the exact type of contraction and the extent of surgery needed; but the diagnosis can be made with reasonable certainty in most cases at the first examination and the patient informed that relief should be possible. It must be explained that treatment is not carried through without some discomfort, and that it will take at least three weeks of daily treatment before recovery is complete.

Previous to operation the bowel must be thoroughly emptied. Caudal block together with parasacral anesthesia is best for securing adequate relaxation. If contraction is of type 1, viz., that in which only a limited segment of the canal is involved, the central opening through the valve-like obstruction is first enlarged as much as possible without tearing. When that point is reached, radial incisions with scissors or scalpel are made as frequently as necessary through the inelastic band down to normal tissue. These incisions are repeated at sufficiently frequent intervals so that retension may be carried out without trauma. Some allowance must be made for contraction which always accompanies healing. This is accomplished when the index, middle and ring finger of the right hand can be inserted through the anal orifice to the matacarpophalangeal joints without overlapping, and the middle finger of the left hand can be inserted over these to approximately the same distance. The writer has had no experience with a localized lesion occupying the orad extremity of the anal canal, but it seems reasonable to assume that should the valve-like lesion be located in the neighborhood of the pecten or pectinate line, sufficient retension would be accomplished when the index and ring finger together with the overlapping middle finger pass freely into the rectum.

The same procedure is performed in the second type of contraction, viz., that in which a considerable portion or all of the anal canal is lined with scar tissue, except that incisions are more extensive. They are extended throughout the entire length of the canal from the pectinate line or slightly above, down to and including the anal orifice. They should sever the inelastic scar tissue completely and expose the fibers of normal tissue beneath. Retension as described before is necessary but it must be remembered that the anorectal bundle tolerates manipulation poorly. On the other hand, the fibers of the bundle do not have the tendency to contract postoperatively as do those of the external sphincters, so that patency will persist if the ordinary anoscopes can be inserted without force at the time of operation.

Postoperative treatment of type 1 and type 2 is identical. As soon as surgery is completed, a square of gauze impregnated with aqueous zephiran is inserted into the canal and left in place for approximately five minutes. A pressure dressing is then applied.

Very little bleeding will be encountered, and the dressing may be removed in twenty-four hours. On the second day, and preferably each day thereafter, the anal canal must be retensed. Three plain tubular anoscopes are best for this purpose. The first one should be approximately 1¾ cm. in diameter and fitted with a tapering obturator; the second should be about 2¼ cm. in diameter; the third should be at least 3 cm. in diameter. This retension must be repeated daily for, when a longer time elapses, cut sur-

faces will have started to heal from side to side, and in tearing them apart, bleeding and/or pain will often interfere to such a degree that the patient will fail to cooperate or will terminate treatment entirely. In any event if retension is delayed, anesthesia might be necessary the first time an anoscope is inserted.

The following cases are quite typical of the postoperatively contracted anal canal and illustrate the good results of adequate treatment. Routine physical and sufficient laboratory examinations were done on both patients.

Mrs. D. D., age forty, was seen for the first time in this office on July 19, 1945. She stated that for eighteen years she had suffered from hemorrhoids. She had been operated upon in June, 1944, and again three weeks before coming to this office, both times without relief. There was a continuous throb and sharp, shooting pain in the rectum. She was constipated and took a tablespoonful of mineral oil every night. She had lost 12 pounds. The anus was small. Operation for postoperative contracture type 1 was performed on July 21, 1945. Treatment was carried out at first daily and later at gradually increasing intervals. After months of freedom from discomfort she was discharged as cured on January 17, 1946, and has remained well since that time.

Mrs. A. M. S., housewife, age fifty-six, residing in a city some distance from Boston, was first seen in this office on November 21, 1947. One year before she had noticed soreness in the anal canal. Her father died of cancer of the rectum in 1946, and her husband died suddenly in August of the same year. In November, 1946, hemorrhoidectomy was performed elsewhere by a general surgeon after a proctologist had said he could find nothing wrong. Following operation she was much worse, and there was a different type of soreness. She felt raw and as though something at the opening of the anus blocked the channel. She was told there was nothing wrong and was advised to see a psychiatrist. There was no bleeding, protruding, itching and no weight loss. On November 29, 1947, operation for postoperative contracture type 2 was performed. She was seen every other day until February 7, 1948, then weekly until March 24, 1948. At that time there was no evidence of contraction and she was discharged. She was seen again in October, and there was no sign of recurrence. On January 18, 1949, she returned saying that so far as the anus was concerned she felt perfectly well and was convinced that she had fully recovered. The anal ring was soft and she was 100 per cent continent.

SUMMARY

Contraction of the anal canal may be classified according to pathologic conditions as of three general types. Types 1 and 2, which usually follow some operative procedure, are the subject of this paper.

Diagnosis depends upon history of previous operation, continued pain, increasing constipation and a sensation that the anal opening is too small. Complete relaxation under adequate anesthesia may be necessary before the exact type of contraction is ascertained.

Pectenosis and coccygodynia, which are not so well known, are discussed in somewhat greater detail than other conditions to be differentiated from postoperative anal contraction.

CONCLUSION

Postoperative anal contraction is a pathologic condition from which the patient suffers almost pathognomonic distress. Cure may be expected following competent surgery and adequate postoperative care.

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DISCUSSION

James Morgan (San Francisco, Calif.): Dr. Ditmore talks about terms that he uses. I dislike one of them. I wish it were not in the books. I wish it was not on the tongues of doctors. That is the term, tight sphincter. I do not know what a tight sphincter is. I do not believe that anyone could define it very easily. There are 520 muscles in the body, and this poor external sphincter gets the blame for lots of things. It is a perfectly fine voluntary muscle, but I do not believe a muscle can be tight. I think we should talk about the orifice and leave it at that. The term, tight sphincter, gets us into the habit of thinking that the muscle is the main factor.

The subject, I think, is very important. The contracted anal canal occurs in more than half our patients. Nearly everyone with anal fissure or external hemorrhoids and some with internal hemorrhoids and severe rectal constipation have this malady. We call this condition pectenosis, which is acquired fibrosis of the submucosa of the anal canal and which always is on the basis of trauma.

We might all be better off if we would call the

lesion non-specific benign stricture. Pathologic changes in the anal mucosa and the surrounding muscles do not seem to be important. Many proctologists believe that the condition is on the basis of fibrosis of the subcutaneous bundle of the external sphincter. I think that the pathologic reports from repeated sections taken at operation by my pathologists can challenge these findings.

For the past eleven years we have used sodium pentothal® anesthesia supplemented occasionally by nitrous oxide and oxygen inhalation for all of our minor surgery. It is ideal for our purposes. The anesthetic simply puts the patient to sleep, and that is all I want. We do not want the tissues distorted by local injections or made limp, flaccid and completely changed in contour by spinal, transacral or caudal block.

When the pecten band is completely divided, there is no need for stretching. Postoperative dilation is unnecessary. Now, of course, one has to be sure that the band is completely divided. If it is not, part of the band may act as a splint and it will not take long before the fibrosis will reform. Just the same one must not go too far. We have no argument with men who cut the external sphincter. I do not think it makes very much difference whether or not this is done, except that we take some chance with incontinence later. However, this is not the problem because if we cut the external sphincter and leave part of the pecten band, the patient will not be cured.

The fibromuscular insertion of the levator, which is really the puborectalis muscle, should never be divided. This is the "bundle" which Dr. Ditmore quotes Mr. C. Naughton Morgan as describing as the important vulnerable structure.

Our patients are more comfortable and very few of them need to come to the office more than once or twice after they leave the hospital. We never use an instrument for postoperative dilation in or out of the hospital, and this may account for the fact that our patients never terminate treatment until we dismiss them. The patient is given complete printed instructions when he enters the hospital to tell him how to behave and what to do when he goes home. In this way we get excellent cooperation.

DAVID C. DITMORE (closing): We must remember that the size of the anal orifice, whether contracted or patulous, depends entirely upon the integrity of the tissues surrounding it. These tissues are primarily the skin, connective tissue and adjacent muscles. When any one of them becomes contracted due to the loss of elastic fibers or the formation of scar tissue, the entire sphincteric apparatus or any component of it becomes affected and gives a sensation of tightness to the examining finger. It is in this sense that the term, tight sphincter, is used in this paper.

Dr. Morgan mentions pectenotomy for cure of contracted sphincter. I prefer to reserve that procedure for cases in which the pecten is involved. In those instances in which there is both a pectenosis and a contracted anal orifice the two operations may be combined. One procedure alone would not, in my experience, cure the patient.

STRICTURE OF THE RECTUM*

A NEW TREATMENT

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THIS paper describes the endoscopic electrothermic resection of rectal strictures by means of the author's double loop high frequency resector. It also evaluates the early or short term results. Although primary consideration is given to the treatment of diaphragmatic or ring-like strictures, the management of the tubular type of stricture will be considered.

This instrument was originally designed for the experimental removal of large sessile adenomas of the rectum and rectosigmoid.[1] It was modified and made suitable for the resection of tougher tissue such as a fibrous stricture.

The resector consists of a larger distal and a smaller proximal tungsten wire loop mounted at the distal end of an insulated shaft which are actuated through the handle. (Fig. 1.) The proximal loop, which may move a longitudinal distance of about 2 cm. parallel to the shaft, transmits the cutting current and meshes into the stationary, inactive distal loop. The shaft with the loops has a rotating mechanism near the handle which permits rotation of 360 degrees similar to that of the author's cold biopsy forceps.[2]

The wire loops offer practically no obstruction to vision so that the operation and the lesion remain in full view during resection. The apparent lack of resistance of the tissues to the cutting current makes possible the light construction of the wire loops. Most of the removed tissue retains sufficient of the original architecture to render the specimen suitable for microscopic study. The source of energy is a surgical diathermy unit.

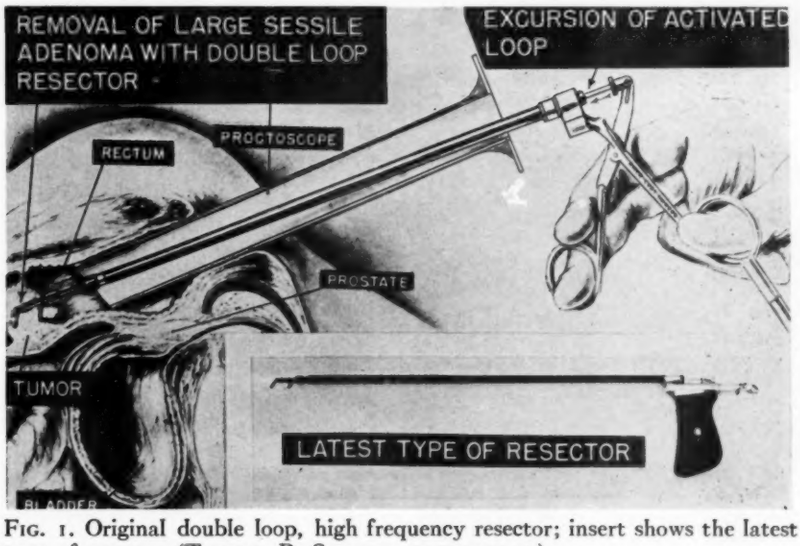
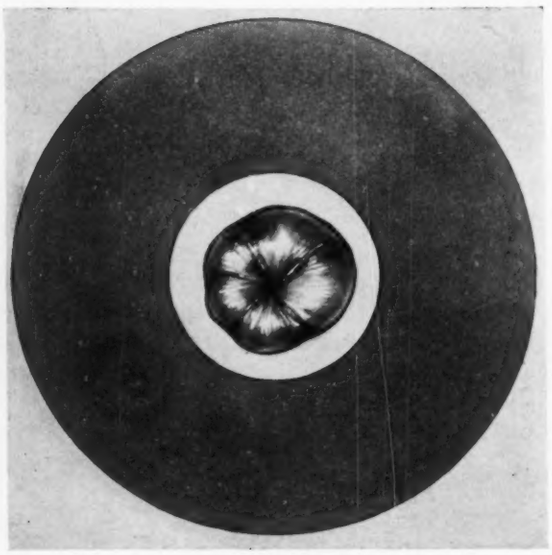


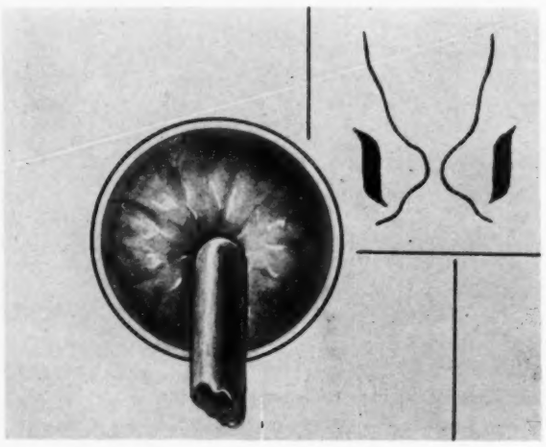
FIG. 1. Original double loop, high frequency resector; insert shows the latest type of resector. (TURELL, R. *Surgery*, 12: 729, 1942.)

The present preresection preparation in unobstructive cases consists of two enemas of lukewarm, plain water taken at a six-hour interval five days and again one day before the scheduled time of resection. A bland liquid high caloric, high vitamin and high protein diet is ordered; in some cases this diet is supplemented with a high protein, easily digestible commercial preparation between meals. Slowly

*From the Surgical Services of the Beth Israel, Harlem and Montefiore Hospitals, New York, N.Y.



2A



2B

FIG. 2. A, shows small caliber of stricture; B, same as A with Hegar dilator *in situ;* insert shows circular encroachment of rectum by stricture.

absorbable sulfonamide drugs such as sodium phthalylsulfacetamide (thalamid)[3] are given orally in maximum doses (about 3 gm. or 45 gr. every four hours) for five to seven days before resection. This may be fortified optionally by orally administered dihydrostreptomycin (about 0.5 gm. or 7½ gr. every six hours) for forty-eight hours. Patients with strictures caused by venereal lymphogranuloma usually receive aureomycin (0.5 to 1 gm. or 7 to 15 gr. in four divided doses daily) for at least five days before and for a variable period of time after resection because of the specific antivirucidal effect against the organism causing this lesion.[4]

TECHNIC

The anesthetic used for most cases has been spinal anesthesia using procaine hydrochloride or pontocaine (dimethylaminoethyl-p-n-butylaminobenzoate hydrochloride); caudal and transsacral block anesthesia is also used on occasion. After the induction of anesthesia the patient is placed in the prone, modified jackknife or inverted position.

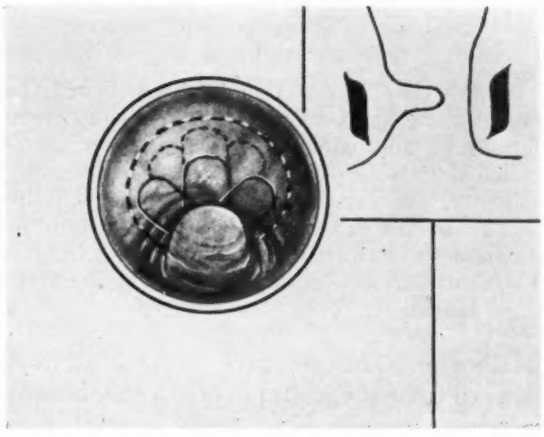
When strictures of very small caliber are present, (Fig. 2A) the lumen is dilated by means of uterine (Hegar) sounds (Fig. 2B) until the opening permits the passage of the distal loop of the resector. Once this is accomplished resection is begun by activating the proximal loop with the desired intensity of the cutting current and the loops are closed. (Figs. 3A and B.) These maneuvers are repeated until the posterior and most of the lateral walls of the stricture are resected. (Figs. 4A and B.) To date utmost caution has been exercised in the resection of the anterior wall of the stricture in order to avoid possible intestinal perforation. This procedural policy will be continued until more experience has been gained concerning the optimum amounts of tissue that may be removed safely during the initial resection. For the present I prefer to err on the side of conservatism and to repeat the resection if insufficient tissue has been removed at the original procedure.

Bleeding is usually prevented by the hemostatic effect of the cutting current or it is easily controlled by coagulation with the same instrument merely by substituting the coagulating for the cutting current. Furthermore, the electronic control of the cutting and coagulating currents can be facilitated by the use of the McCarthy remote control handle. Occasionally, a special grasping and coagulating forceps is used especially for the control of spurting vessels.

The preresection plan of administration of sulfonamide and antibiotic chemotherapy is continued for from five to ten postresection days. A full or regular house diet is allowed. Patients are ambulated within twenty-four hours after resection.

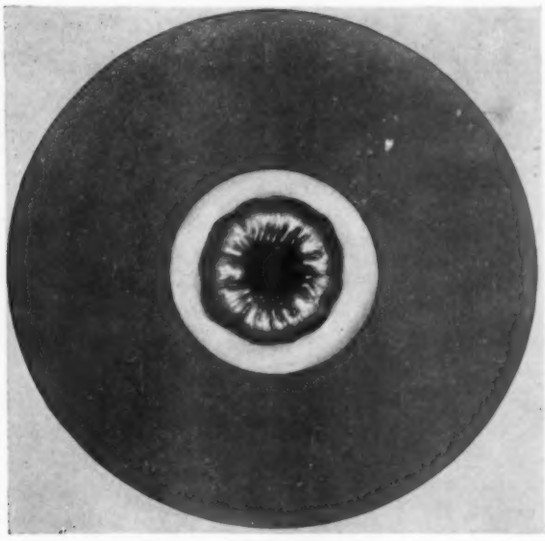
Of the eleven patients treated up to the time of this report (December 20, 1949) the immediate postresection course has been smooth except for (1) the exacerbation of diarrhea in a boy fifteen years old about four

3A



3B

FIG. 3. A, loops of resector are closed and ready for resection; B, outline of extent of lateroposterior congenital stricture as well as of areas to be resected; insert shows incomplete encroachment of rectum by stricture (anterior aspect was free from involvement).



4A

4B

FIG. 4. A and B, immediately after resection.

days after the resection of a congenital stricture (Fig. 3B) and (2) the occurrence of fever (up to 103°F.) of two days' duration in the first two patients with stricture caused by venereal lymphogranuloma. This complication apparently responded to the administration of aureomycin the pre- and postresection administration of which has since become routine.

CASE REPORTS

Benign Congenital Strictures

CASE 1. A white girl aged eleven years was seen in August, 1942, because of tenesmus and a sense of incomplete defecation. Digital and endoscopic examinations revealed a thin but firm, fibrous stricture occupying the posterior and most of the lateral walls of the rectum situated at the anorectal line. The ⅝ inch size sigmoidoscope could not be inserted into the lumen of the stricture, but by placing the end of the scope against the stricture, the mucosa for a distance of about 2 inches (5 cm.) orad to the stricture was seen to be normal. Because antecedent therapy including dilatations was ineffectual, resection by the technic described herein was decided upon as a therapeutic trial prior to surgical intervention. Only three pieces of tissue were resected; one from the posterior surface and one from each lateral aspect of the stricture. This procedure resulted in the immediate relief of symptoms which continued for several months.

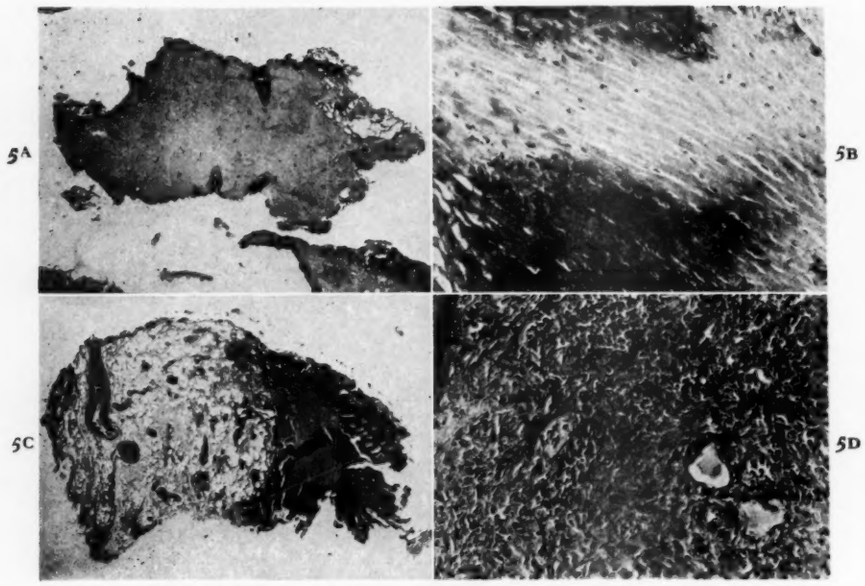


FIG. 5. Microscopic appearances of removed specimens.

Comment. The early successful result in this solitary clinical experiment proved the technical feasibility (that was then only a speculative thought) of this procedure and led to the present investigation which in its beginning was interrupted by the war for a period of over four years. Recently two additional but very similar cases have been successfully resected with the removal of considerably more tissue. This procedure is analagous to the transurethral electrothermic resection of median bars at the vesical outlet.[5]

CASE II. A white woman, fifty-three years old, was seen because of intermittent lower abdominal cramps and "constipation" necessitating the employment of mineral oil, cathartics and enemas. Examination performed on May 17, 1949, revealed a circular but very small-calibered stricture of the rectum situated about 1 cm. orad to the mucocutaneous junction. (Figs. 2A and B.)

On June 16, 1949, under spinal anesthesia, the lumen of the stricture was dilated with the aid of Hegar uterine dilators (Fig. 2B) until it was possible to engage the distal loop of the resector on the posterior wall of the stricture. (Fig. 3A.) By the removal of six segments of tissue the lumen of the stricture was enlarged enough to permit the passage of a sigmoidoscope 7/8 inch in diameter easily; the mucosa orad to the stricture was normal. The histologic examination of the removed specimens showed "fragments of rectal mucosa and bowel wall." (Fig. 5A.)

At the time of resection it was believed that enough tissue had been removed. Follow-up examinations at approximately monthly intervals revealed that while the patient had no defecatory difficulty, she experienced pain upon the introduction of the examiner's index finger into the lumen of the resected stricture. It is now believed that another resection will be necessary to effect a larger lumen.

Comment. The stricture in this adult is believed to be congenital in origin only because no other causative factor could be established after an exhaustive study. In this instance a pull-through type of operation or perhaps a Swenson procedure[6] would have been necessary for the preservation of sphincteric control. It is doubtful that an anastomosis through the sacral approach would have been technically feasible; a standard transabdominal resection and anastomosis was definitely out of the question.

Benign Postoperative Stricture

CASE III. A white man sixty-four years of age, following an abdominosacral resection of a rectal papillary adenocarcinoma, had a soft shelf on the anterior and lateral surfaces of the line of anastomosis. Although the index finger could be inserted easily beyond this shelf, it was nevertheless believed that it should be excised prior to closure of the complementary transverse colostomy in order to circumvent any possible future impediment to the

act of defecation. Consequently, on July 26, 1949, a large portion of the shelf was resected. (Fig. 6A.) The histologic examination of the removed tissue showed "fragments of rectal mucosa and rectal wall." (Fig. 5B.) Follow-up observation is unavailable as this patient died of what appeared to be a pulmonary embolus five days after the closure of the colostomy or nine days after resection of the stricture.

Inflammatory Strictures—Venereal Lymphogranuloma

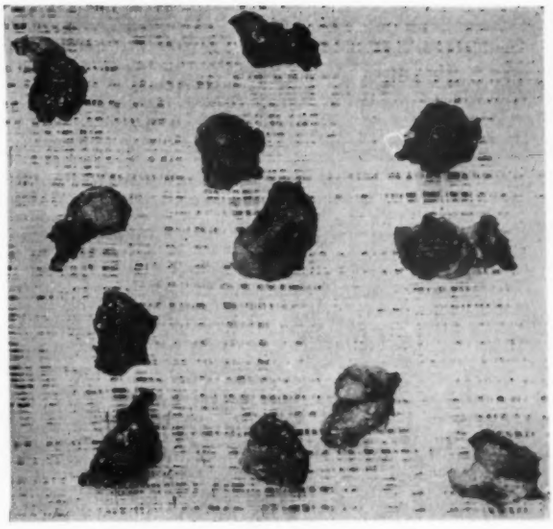
CASE IV. A colored woman aged thirty-eight years had two rectovaginal fistulous tracts and a narrow-lumened, dense, fibrous, circular rectal stricture situated about 1 cm. above the anorectal line. This caused obstructive symptoms and the passage of a pencil-sized stool. Resection of the stricture was performed on October 14, 1949, excising the posterior and most of the lateral walls of a stricture the width of which was almost 2 cm. (¾ inch). Sigmoidoscopy performed with a scope of ⅞ inch in diameter at the conclusion of the resection showed a normal mucosa orad to the stricture. The microscopic examination of the excised tissue (Fig. 6B) showed "scar and chronic granulation tissue." (Fig. 5C.) This patient has remained symptom-free and has had daily evacuation of a normal-sized stool. On December 6, 1949, I successfully repaired the rectovaginal fistulas.

CASE V. Another colored woman aged forty years had a circular dense, fibrous, very small-calibered stricture at the anorectal line causing straining at defecation and the passage of pencil-sized stools. This stricture, more than 1 cm. (½ inch) wide, involved and caused distortion of the anal canal and was accompanied with a subcutaneous anal fistula. On September 23, 1949, several pieces of tissue were resected mainly from the posterior and the lateral walls of the stricture. The histologic examination of the excised tissue showed "a chronic granuloma and evidence of acute inflammation." (Fig. 5D.)

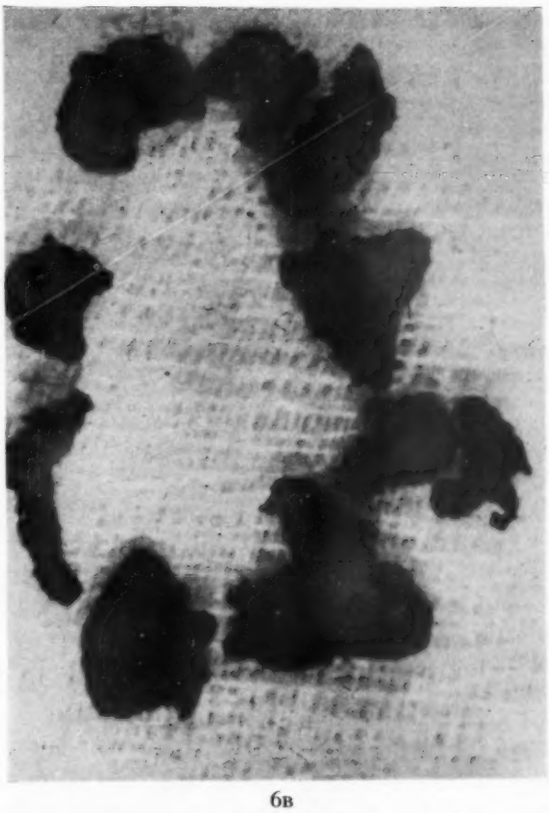
The lumen of the stricture which before resection was too small for the passage of the distal loop of the resector permitted the easy passage of an adult-sized sigmoidoscope at the conclusion of the resection. The bowel for a distance of 7 to 8 cm. (3 to 3½ inches) immediately orad to the stricture was inflamed and bled easily on wiping with a cotton applicator.

Since resection this patient has passed daily, normal-sized stools and has gained weight.

Although this patient has remained well and has had no complaints, on digital rectal examination there nevertheless has persisted tenderness and a suggestive narrowing above the resected stricture. Consequently, an additional resection was planned for October 28, 1949. However, a digital examination performed after induction of anesthesia disclosed no narrowing. Sigmoidoscopy revealed the appearance of the area cephalad to the resected stricture to be essentially the same as that of the conclusion of the resection one month earlier. No further resection was therefore attempted and,



6A



6B

FIG. 6. Gross appearance and number of removed specimens; A, Case III; B, Case IV.

instead, an intensive course of aureomycin therapy was instituted for the control of the inflammatory process present above the resected area. Spasm accompanying inflammation may have been the cause of the tenderness and of the apparent narrowing in this instance.

CASE VI. A forty-two year old colored woman in whom about one year before the present admission a sigmoid colostomy had been performed because of acute obstruction produced by a rectal stricture, was found to have a tubular type of stricture with a very tight, pinpoint, circular fibrous opening located about 5 cm. (2 inches) above the anorectal line. This caudal lumen of the tubular stricture was resected electrothermically on October 5, 1949, excising the posterior and most of the lateral walls. Evidence of inflammation for at least 8 cm. (3 inches) above the resected area was discernible on sigmoidoscopy. The diseased portion of the bowel was examined digitally by inserting an index finger of the right hand into the distal colostomy loop and the index finger of the left hand into the rectum. No impediment to the meeting of the two fingers was encountered while the patient was under the effects of anesthesia. (This examination was extremely painful when performed without anesthesia.)

The histologic examination of the excised tissue showed, "scar and chronic granulation tissue."

The therapeutic plan decided upon after electrothermic resection of the stricture was an intensive course of aureomycin and closure of the colostomy which I performed on November 22, 1949. The patient is now having uneventful daily bowel movements except for pain in the anus during an occasional bout of diarrhea (the latter was thought to be a reaction to aureomycin).

Comment. Case IV represents a successful immediate result comparable to that of Case I. The stricture in this patient (complicated by two rectovaginal fistulas) was situated too low to lend itself to excision and end-to-end anastomosis. Only a pull-through type of procedure might have been feasible in this instance.

Case V represents an immediately successful result following resection in a patient with a more advanced lesion due to subacute inflammation of the bowel immediately cephalad to the resected area, distortion of the anal canal by fibrosis and the presence of an anal fistula. In the past this type of lesion demanded a Miles abdominoperineal resection of the rectum; a pull-through procedure with questionable fecal continence resulting would have been of doubtful value in this instance.

Case VI would have been suitable for primary intestinal resection and end-to-end anastomosis as the lowermost end of the stricture was situated about 5 cm. (2 inches) above the anorectal line.[7] However, for experimental reasons an electrothermic resection of the dense, pinpoint, caudal end of the tubular stricture was performed, followed with an intensive course of aureomycin and closure of the colostomy. It is my present assumption that the tubular stricture consists of two separate lesions or components: (1) a primary, ring-like, fibrous stricture low in the rectum which antedates (2) the subacute or chronic inflammatory process above by a variable interval of time. This inflammatory process may be maintained by the presence distally of an obstructive fibrous ring.

As a therapeutic experiment I propose to eliminate the dense fibrous barrier by electrothermic resection and to treat the remaining subacute or chronic inflammatory process with aureomycin. The late results will be reported upon the completion of our projected studies.

Malignant Stricture

To date only one patient with a stricture caused by recurrent carcinoma following the performance of the operation which is known as an anterior resection has been subjected to the procedure herein described. This was done for an impending obstruction in a patient with failing vision and advanced metastases who otherwise would have required an abdominal colostomy.

The execution of the procedure was rendered more difficult by the presence of a sharp angulation of the bowel and increased bleeding.

CONCLUSIONS

The foregoing is a preliminary report. With the exception of strictures caused by venereal lymphogranuloma, only a few benign strictures due to other causes have been available for this investigation. Considerably more experience is required to determine the safety of removal of the maximum amount of tissue at the first or original resection.

The early or short term results have been very encouraging. If the late results in a large series of treated patients are equally as good, the management of either the narrow or the broad type of diaphragmatic stricture will be greatly simplified. (The subject of rectal stricture caused by venereal lymphogranuloma remains under a comprehensive special study

at the Harlem Hospital and will be reported on at a future time.)

SUMMARY

In this paper the technic of endothermic resection of diaphragmatic strictures of the rectum by means of the double loop, high frequency resector is described and illustrated. While this work is still in its beginnings, the early results have been encouraging enough to warrant the continuation of this method of therapy and its extension to the treatment of the tubular type of stricture. A final evaluation of the procedure must await a prolonged period of follow-up observation (at least two years). Although the feasibility and the technic of electrosurgical resection of rectal strictures by means of the author's instrument has been established, this procedure is still in the experimental stage.

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DISCUSSION

Tom Smith (Dallas, Tex.): I would like to ask you to reflect for just one minute on where proctology would be today had we not had men like Thomas A. Edison. Many times those of us—and when I say those of us, I feel I am in the majority group when I make this statement—are men without a great deal of mechanical vision. We are men without the ability to dream up things to advance and make our technics a little better or make things smoother for us to produce better results for our patients. Therefore, those of us without that skill are quick to criticize those men who have such mechanical vision to conjure up or dream up instruments that will be of benefit to us and to our patients.

It is very easy for those of us who have never devised an instrument to be very critical. That, of course, is our first impulse—to begin to look for points of criticism immediately—but we must remember had we not had our Edisons and men of that type, I can assure you we would be back in the prehistoric stage of proctology and doing our field as it was done even before the days of Ambroise Paré.

Let me first congratulate Dr. Turell on this fine instrument. Secondly, let me disagree on the title, "Rectal Stricture—A New Treatment." It is my belief that this is not a new treatment. It is my belief that he has reported a new instrument and for that I congratulate him. His treatment in my opinion is not new because you can find many old textbooks dating all the way back to the days of the use of the Post or Paquelin cauteries which mention cutting rectal strictures.

There have been instruments devised to do the same sort of thing that Dr. Turell reports, that is, to remove strictured tissue within the rectum, both malignant and non-malignant. Most of us, for inoperable cases of adenocarcinoma, have done the thing that Dr. Turell has reported with his instrument, that is, we have resected tissue to make a passageway. We have also done the same thing with different types of instruments for the lymphopathia venereum or lymphogranuloma strictures, if you wish to call them that. Actually, a great many men in this room have done the same things that Dr. Turell has talked about, but we have used different cold and hot or electrical instruments.

I, therefore, believe that we should perhaps argue with Dr. Turell a little bit about whether this is a new treatment, for what difference does it make whether you take the strictured tissue out in a resected bite with a double-bladed instrument such as he does or if you take it out in single bites, using some other sort of holder and some other type of electrosurgical arm or cutting point?

When it is all boiled down, I think we can say that there is a place for all types of instruments and for all types of treatment. Most of the men here are open-minded proctologic doctors who are desirous of doing a good job for their patients who are unfortunate enough to be afflicted with anorectal diseases, and I believe most of us would accept Dr. Turell's report in an open-minded way and congratulate him on the instrument. I daresay a great many of us will purchase this instrument and find it useful for cases such as he has outlined.

Robert Turell (closing): I will concede that Dr. Smith may have a point. The treatment may not be new. However, I was not aware that it had been done before in the manner presented here. I tried to organize the subject as well as to present something that I thought we could work with with greater ease and produce at least short range acceptable results.

SODIUM PENTOTHAL® WITH CAUDAL ANESTHESIA IN ANORECTAL SURGERY

STEWART R. JONES, M.D.
Cincinnati, Obio

ALTHOUGH intravenous sodium pentothal® has been reported as a basal anesthetic in various surgical procedures, a search of the literature did not reveal its use associated with caudal anesthesia in anorectal surgery. This paper reports a series of 304 cases divided as in Table 1.

TABLE 1

Type of Anesthesia	No. of Patients
Sodium pentothal® with caudal	148
Sodium pentothal® alone	80
Transsacral caudal	48
Spinal	28

Anesthetic hazards to the patient were considered of paramount importance. These were given first consideration and often resulted in the rejection of one or another type of anesthesia. Each patient was carefully selected. Those with respiratory or cardiovascular disease of a chronic type were generally given spinal or transsacral caudal. The emotionally unstable, the apprehensive without these contraindications, those patients with organic nervous disease and patients with fused spines were generally given sodium pentothal® with caudal. Ages of patients were distributed from the second to the eighth decades of life. Children have been eliminated from this series since inhalation is uniformly used in these cases.

Since adequate local relaxation is essential to the proper performance of anorectal surgery, only those types of anesthesia which would produce adequate relaxation for the procedure in mind were selected. Spinal, transsacral caudal and sodium pentothal® combined with caudal provided adequate relaxation with few exceptions and were acceptable to the patient. In our experience the quantity of sodium pentothal® required to produce relaxation when used as the sole anesthetic is large enough to be hazardous. However, it is a very useful and safe anesthetic in many anorectal procedures not requiring such muscular relaxation.

The immediate risks of the combined anesthetic should be minimal. In this series shock was not encountered and pulmonary complications were not observed. In a few cases mild respiratory depression occurred with the rate as low as ten per minute. Because of respiratory depression coramine in small fractional doses was administered to only two patients postoperatively; both of these were in the third decade of life. The sodium pentothal® fraction of the combined anesthetic in this series was given by fifteen different anesthetists, all competent. All but one used 2½ per cent solution. This individual preferred 5 per cent.

Postanesthetic complications decrease the usefulness of an anesthetic or combination in proportion to their frequency. When spinal anesthesia was used, two of these, headache and urinary retention, had been particularly annoying and distressing to the patients.

Headache following spinal anesthesia was most disabling. The frequency of this complication has been variously estimated. Raney[1] and Weintraub[2] state that the incidence is between 10 per cent and 25 per cent.

Urinary retention was the other complication of spinal anesthesia which was most trying. Ericsson[3] states that the incidence varies from 0.4 per cent to 3 per cent, some prolonged to two months. A single catheterization postoperatively in Ericsson's series did not constitute urinary retention. Although in this series retention was not prolonged, 4 per cent of the individuals who had sodium pentothal® with caudal anesthesia were catheterized one or more times. Two were catheterized three or more times before they became voluntary. Those having spinal were catheterized in the ratio of one patient in eight, approximately 12 per cent; those with transsacral caudal, one patient in twenty-five, approximately 4 per cent; those with sodium pentothal® and caudal, the ratio was 1:25 or approximately 4 per cent, both a marked improvement over the incidence with spinal anesthesia.

Our procedure is simple. The patient is placed

in Kraske or similar inverted position on the operating table. The anesthetist then administers 2½ per cent sodium pentothal® solution, usually into one of the veins of the dorsum of the hand. Opportunity to pass the proctosigmoidoscope is now provided in patients with

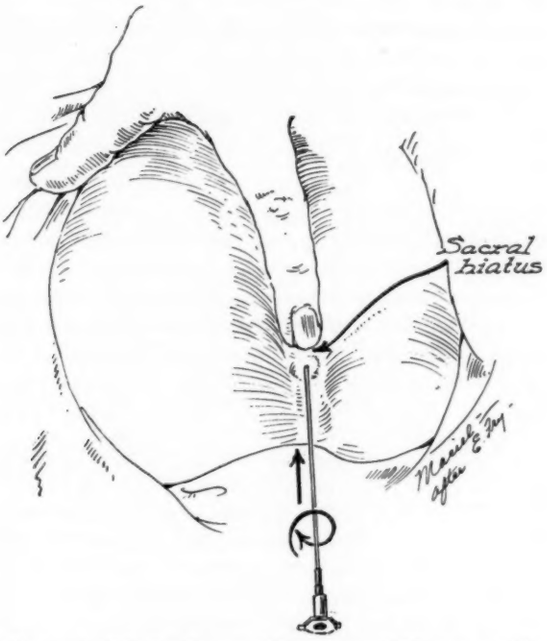

FIG. 1. Left index finger palpates sacral hiatus as right hand inserts needle.

extreme sphincter spasm. The level of anesthesia maintained is just sufficient to permit introduction of the Lundy caudal needle without pain to the patient. A Lundy needle, 8.0 cm. in length, is passed through the sacral hiatus into the canal, and 25 to 30 cc. of 1 per cent metycaine solution freshly prepared from glass ampules is injected slowly into the canal after aspiration to ascertain that the needle has not been introduced into the dural sac. Evidence of anesthesia above the desired level has not been observed. Adrenalin (1:1000) 0.3 cc. in 50 cc. of the solution is usually added. (Fig. 1.)

It is to be emphasized that the patient is asleep so that the introduction of the needle does not produce discomfort. Only one needle is necessary to produce the desired anesthesia, whereas in transsacral caudal seven are necessary, one in the sacral canal and three on either side in the sacral foramina. Anesthesia is satisfactory in most cases immediately after the injection; however, when possible surgery in the posterior anal quadrant is performed initially since anesthesia in the anterior quadrant may be somewhat delayed in a few instances. Experience on the part of the operator in the introduction of the needle is desirable, but proficiency in the procedure can be readily

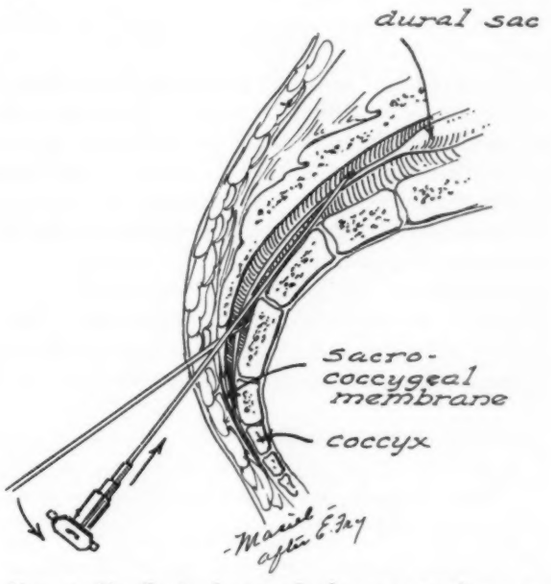

FIG. 2. Needle is depressed after penetrating sacrococcygeal membrane and further inserted; aspiration assures that needle has not entered the dural sac.

acquired by careful attention to the anatomy and the elimination of those cases of patients with developmental sacrococcyeal anomalies. It is well to palpate the sacral hiatus and general conformation in the office prior to the selection of the anesthetic. (Fig. 2.)

Since it was desired to eliminate spinal headache and urinary retention, an attempt was made to find an adequate substitute. It is believed that progress has been made since the advantages of sodium pentothal® with caudal anesthesia are many and the complications are relatively few.

The advantages are as follows: (1) With sodium pentothal® induction is pleasant; discomfort from the needle was not experienced. (2) No serious complications were encountered although respiratory depression was noted. Laryngospasm, commonly regarded as a hazard, was not encountered. (3) Immediate postoperative course was smooth; usually the only nausea encountered was that due to the narcotic drugs administered. (4) The narcotic

dosage was decreased in most instances by one-half to one-third.

The nursing care was increased during the recovery period, but in some hospitals this has been provided for by having a recovery room in which a single nurse can attend several postoperative patients.

CONCLUSION

Intravenous sodium pentothal® combined with caudal anesthesia is most acceptable to the patient. The procedure is simple and relaxation adequate. Incidence of urinary retention is decreased as are the dosages of opiates. Postoperative complications which could be attributed to anesthesia were not encountered in a series of 148 operations performed under this type of anesthesia. Most important, postspinal headache was eliminated without adding immediate or delayed anesthetic risks.

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DISCUSSION

George N. Wenger (Massillon, O.): There are many satisfactory anesthetics for anorectal surgery; and if one is hazardous or not suitable for that particular person, another may be selected. Transsacral or caudal block, excellent anesthetics, are impractical in our hospitals on account of the time element since we have no anesthetizing room and forty-five-minute periods are allotted for the induction and surgery in hemorrhoids, fissure and simple fistula surgery.

Since reading Dr. Jones' paper I have given sodium pentothal® combined with caudal block in a few selected cases with excellent results. Of course, there were no headaches and the percentage of urinary retention was about the same as other anesthetics. All were catheterized once. Unless sufficient time is taken for the caudal block to take effect, surgery will be done under sodium pentothal® anesthesia. This will, of course, lessen postoperative discomfort. This anesthetic is very kind to the apprehensive patient. Many folks ask for the kind that is injected into the vein. Our anesthetists hesitate to give sodium pentothal® with the patient in the jackknife position except with a heavy sandbag under the pelvis so that the chest has ample space for excursion.

My favorite anesthetic, best suited to our local hospital conditions, is the low spinal. Preliminary narcosis is induced by ½ gr. nembutal ninety minutes and hyocine 1/150 gr., morphine ¼ gr., forty-five minutes before surgery, except in elderly folks when the hyocine is omitted. This reduces apprehension and many patients sleep throughout the entire procedure. Metycaine, 15 to 18 mg., in 1.5 per cent of Ringer's solution is then injected intrathecally at the fifth lumbar interspace.

A gold twenty-one-gage Leahy needle is used, and the point is so introduced that the longitudinal fibers of the dura are split rather than cut crosswise. The patient is then immediately turned on his abdomen and placed in the jackknife position when anesthesia is obtained, which is usually as soon as he is prepared and draped for surgery.

No attention is paid to position as far as the anesthetic is concerned. We get at least one hour of complete saddle anesthesia, only the perineum and anal area are anesthetized. When this technic is used, the headaches are negligible. We have given over 5,000 low spinal blocks, personally about 1,500 of these were metycaine in Ringer's solution, with no mortality and the only complications were headaches and retention. I sometimes think surgery of the anus and rectum may be the cause of some of the retention since we have it in all types of anesthesia. In a review of the last 300 cases we have had three postspinal headaches which warranted some treatment. Ten cc. of naotin (nicotinic acid) were given intravenously with almost immediate results. None had headache on their discharge from the hospital on the fourth day.

ROLE OF CHLOROPHYLL IN PROCTOLOGY

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THE proctologist is often confronted with postoperative wounds, particularly when large areas of tissue have been removed, in which healing is delayed and the patient is inconvenienced by prolonged pain and soreness in the affected part.

With this in mind the author's attention was directed to two forms of a preparation* containing an unusually high concentration (20 per cent) of the safe topical anesthetic, benzocaine, in effective soluble form.

Tainter[1] in a series of studies involving about forty different local anesthetics found benzocaine to be the best topical anesthetic. Adriani[2] in evaluating the relative toxicity of various topical anesthetics found benzocaine to be the safest. He states that benzocaine is fifty times less toxic than the drug, nupercaine.

Finkel, Levine and Wohl[3] have reported favorably on the use of 20 per cent dissolved benzocaine together with chlorophyll in an ointment in the treatment of burns, ulcers and local necroses. This preparation is unusually effective as a topical dressing for the relief of pain, but of particular interest to the proctologist is the fact that the product is also available in association with chlorophyll.

The effect of chlorophyll on healing in wounds and burns has been repeatedly stressed.[4–15] Various theories have been advanced to explain its action. It has been suggested that it bears a similarity to hemoglobin in physiologic action even as it does in chemical composition.

The hemin molecule of hemoglobin like that of chlorophyll contains four pyrrhol rings. It is probable that its effect on tissue repair may be explained on the basis of its similarity to hemoglobin. Both hemoglobin and chlorophyll are involved in reactions involving oxygen and carbon dioxide interchange.

The bactericidal action of chlorophyll alone against various test organisms is shown in Tables I and II. From these tables it would appear that chlorophyll alone does not tend to inhibit the growth of the organisms tested. It is not notably bactericidal but is slightly bacteriostatic. However, Gruskin[9] attributed to chlorophyll an indirect action on bacteria as judged by the clinical response in anaerobic infections.

TABLE I

Organisms	Dilution of Chlorophyll	Growth
Staphylococcus aureus	1:5 1:50 1:100 1:150	Slight inhibition, 1:5, 1:50, 1:100
Escherichia coli.....	1:5 1:50 1:100 1:150	No inhibition
Aerobacter aerogenes..	1:5 1:50 1:100 1:150	No inhibition
Proteus vulgaris.....	1:5 1:50 1:100 1:150	No inhibition
Bacillus subtilis.....	1:5 1:50 1:100 1:150	Slight inhibition, 1:5
Streptococcus faecalis.	1:5 1:50 1:100 1:150	Slight inhibition
B. pyocyaneus.....	1:5 1:50 1:100 1:150	No inhibition

The preparation under consideration also contains oxyquinoline benzoate which is a well established bactericidal agent. The United States Dispensatory stresses the safety and effectiveness of oxyquinoline benzoate. The Dispensatory reports that even against the pus-producing organism, Staph. aureus, oxyquinoline is actively bactericidal, being ten times as powerful as phenol. This same source further points out that oxyquinoline benzoate is more actively bactericidal than other oxyquinoline salts such as the sulfate. It is recommended as a germicide and fungicide for the treatment of infectious skin diseases. Even in dilutions of 1:3,000 it is used as an antiseptic for wounds and infections of various mucous membranes. This ointment contains more than ten times this concentration (0.39 per cent).

Although chlorophyll is not notably bactericidal or bacteriostatic, it has been conclusively shown that it possesses definite healing powers. According to Smith[4,14] its beneficial effect on healing is exerted through stimulation of the cells in the host.

In cases of ulcerative carcinoma in which putrefaction with associated foul odor exists

* Americaine plain, ethyl-p-amino benzoate (benzocaine) 20 per cent, oxyquinoline benzoate 0.39 per cent in a water-soluble base. Americaine with chlorophyll, the aforementioned formula with the addition of chlorophyll 0.08 per cent. Both forms of the ointment were supplied by Americaine, Inc., Evanston, Ill.

(obviously the result of secondary bacterial infection and proteolysis) the use of chlorophyll effectively and promptly cleared up the objectionable odor.

Smith,[4,14] Euergi,[13] Bolinger[5] and Gruskin[9] have compared the healing properties of chloro-

TABLE II
BROTH STAPH. AUREUS 109 STANDARD TEST ORGANISM

Antiseptic	Dilution	Time: → 5 min.		Time: → 10 min.	
		37°C.	Room Temperature	37°C.	Room Temperature
		+ Growth		− No Growth	
Phenol 5%	1:60	+	−	−	−
	1:70	+	+	−	−
	1:80	+	+	+	+
	1:90	+	+	+	+
	1:100	+	+	+	+
	1:110	+	+	+	+
Alcohol 70%	1:10	+	+	+	+
	1:20	+	+	+	+
	1:30	+	+	+	+
	1:40	+	+	+	+
	1:50	+	+	+	+
	1:60	+	+	+	+
Iodine 3%	1:100	−	−	−	−
	1:200	−	−	−	−
	1:300	−	−	−	−
	1:400	+	−	+	−
	1:500	+	+	+	−
	1:600	+	+	+	−
Chlorophyll	1:20	+	−	+	−
	1:40	+	+	+	−
	1:80	+	+	+	+
	1:160	+	+	+	+
	1:320	+	+	+	+

phyll with vitamin ointments, cod liver oil dressings, sulfa preparations, tetrodine dusting powder and methionine applications. Superior results were obtained with chlorophyll, healing in many cases being accelerated over 25 per cent.

The safety of chlorophyll was affirmed by feeding large amounts to dogs with no untoward effect except for a tendency to diarrhea.

Clinical Field of Chlorophyll. Gruskin,[9] quoting Coombs, refers to two major types of lesions in which chlorophyll seems to be particularly indicated: (1) the treatment of open wounds and (2) the treatment of deep infections.

Patients with compound fractures, osteomyelitis, abscess cavities, deep sinus involvement, decubitus ulcers and similar conditions have been helped by chlorophyll. Gruskin refers to the marked deodorizing effect of chlorophyll when applied to necrotic tissue. He finds that objectionable odors disappear after a few applications. Moreover, itching and burning were eliminated almost immediately.

The fact that chlorophyll is non-toxic is of immense importance to the clinician who has been handicapped in the use of antiseptic chemotherapeutic agents by their tendency to destroy healthy tissue as well as the pathogenic causative agent.

Twenty Per Cent Dissolved Benzocaine with Chlorophyll in Proctology. The use of chlorophyll in local suppurative lesions, either acute or chronic, is comparatively a new procedure. Of vital importance is the necessity for bringing it in direct contact with the pathologic tissues involved. Diffusion of the agent must be allowed to take place throughout the intracellular matrix when its healing action is needed.

Bauers[7] using chlorophyll in 100 cases following excision of pilonidal cysts found that only two cases failed to respond. In many cases the wounds were foul and the granulations grayish, friable and covered with exudate. Within forty-eight hours after the use of chlorophyll solution as a continuous dressing the granulations became odorless and clean and had a clear red color.

In sixty cases of fistula-in-ano in which chlorophyll was used postoperatively as a continuous wet pack, rapid and satisfactory wound-healing was observed.

An ointment containing 20 per cent dissolved benzocaine and chlorophyll has been used in several hundred postoperative rectal cases. The diffusible form in which the topical anesthetic and the contained chlorophyll are in combination is of considerable clinical significance in therapy of deep-seated proctologic conditions. Witch hazel irrigations and hot baths have been used concomitantly in some instances.

Results in general have been gratifying, particularly in operations for pilonidal cyst, when large areas of skin were removed. In these cases denuded areas healed much more rapidly than in individuals not receiving chlorophyll.

In one case neither antiseptics nor ointments

were used, and the patient was allowed to continue for two weeks under the ordinary routine postoperative treatments. Healing was slow, but within one week after instituting treatment with 20 per cent dissolved benzocaine with chlorophyll, the wound had granulated and was closing over.

In only two instances were patients found to be sensitive to chlorophyll. In both of these erythematous lesions developed around the rectal area but responded rapidly to local and oral use of antihistaminic drugs.

SUMMARY

Chlorophyll is a non-toxic, bland substance which should occupy a prominent place in the treatment of acute and chronic rectal infections and wound repair in general.

The similarity of chlorophyll to hemoglobin suggests the reason for the effectiveness of the former as an aid to tissue healing.

Chlorophyll does not possess the antibacterial potency of specific chemotherapeutic agents, but its value in healing cannot be overlooked.

Finally, 20 per cent dissolved benzocaine in a bland water-soluble base provides a potent, safe, topical anesthetic. Combined with diffusible chlorophyll it becomes very valuable when the regeneration of tissue is indicated. Such a preparation has a definite place in the preoperative and postoperative treatment of rectal conditions when relief of pain and pruritus and acceleration of healing are needed.

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DISCUSSION

Clarence A. Straubinger (Buffalo, N. Y.): I would like to say that it is a pleasure to comment on so timely a subject which was so well presented by Dr. Horwitz.

I am sure that we all see patients who have deferred much needed anorectal surgery for a long time, perhaps to the point at which the original condition has become highly complicated, because they fear the postoperative pain connected with this type of surgery. In many cases these fears are well founded. If we can produce clean and early healing in this area, we will do much to shorten the postoperative course and lessen the pain and discomfort. In this respect I believe the water-soluble derivatives of chlorophyll are of definite value. The chlorophyll ointment as used by Dr. Horwitz appears to aid this objective in a threefold manner: (1) the anesthetic value of benzocaine, (2) the antibacterial action of oxyguinoline benzoate, (3) the therapeutic qualities of chlorophyll.

We are all familiar with the use of the first two agents, namely, benzocaine for its local anesthetic value and oxyquinoline for its bactericidal value. These two drugs are used in many different forms and combinations for numerous anorectal conditions. They can be had as ointments, lotions, suppositories and oil instillations. The addition of chlorophyll, however, makes it especially well adapted for proctologic use. Chlorophyll is a good

tissue stimulant and helps to keep the wounds clean and facilitates healing.

As mentioned by Dr. Horwitz chlorophyll bears a chemical similarity to hemoglobin. The iron radical in hemoglobin is the magnesium radical in chlorophyll. It serves with CO_2 to sustain plant life in a similar manner that O_2 and H_b sustain animal life. By its action and with photosynthesis plants are able to convert CO_2 to starches.

About 1911 Willstatter and Stoll established its formula and first produced it in pure form. Since then its therapeutic possibilities have been appreciated and explored by many investigators. In the last ten years much has been contributed to our knowledge of its clinical usefulness by Gruskin, Smith, Livingston and others. It has been demonstrated that chlorophyll has great value in the stimulation of granulation tissue, clearing up of putrefactive processes and such conditions as chronic ulcers, draining sinuses, sloughing wounds and ulcerative dermatoses. It has been used with ever-increasing popularity in almost every type of infected wound. It has been found to be of value in many types of infected wounds and infected burns. Its use in surgery ranges from the treatment of infected amputation stumps to clearing up sloughing areas preparatory to skin grafting. It has also been of value in oral sepsis. The slow granulating wounds of radical perineal resections and fistulectomies have responded well to its use.

As this is a discussion of the role of chlorophyll in proctology we will comment briefly on its use in this field, other than local. Recently, it has been used in aqueous solution in the treatment of various types of ileitus, ulcerative colitis and sigmoiditis. In these intestinal cases it has been used as rectal or duodenal instillation, or a combination of both. As yet reports of this work are rather inconclusive.

Chlorophyll also has great value as a deodorizing agent. This also is of value to the proctologist, especially in the care of ulcerating carcinomatous lesions. A very recent article by Westcott stresses the value of oral chlorophyll fractions for body and breath deodorization. This author by giving 100 to 300 mg. tablets a day claims that he can effectively control all body odors, foot odors and halitosis. The use of this oral form may hold promise for the deodorizing of colostemized patients. We will have to await further investigative work to evaluate this phase of its use.

Chlorophyll is non-toxic in any form whether it is used locally, orally or intravenously. It appears that chlorophyll is a potent drug upon which the proctologist can rely to promote clean and early healing in a highly contaminated area. By keeping the wound clean and free from slough we reduce the postoperative pain because a clean wound is a less painful wound. The stimulation of healthy granulation tissue also is an advantage, as practically all anorectal wounds heal by granulation tissue or secondary intention, irrespective of the surgical technic used.

Thus we may conclude that a water-soluble anesthetic and bactericidal agent with the therapeutic qualities of chlorophyll has a definite and useful role in the armamentarium of the proctologist.

RELATION OF ASCORBIC ACID PLASMA LEVELS TO ANORECTAL CONDITIONS

A PRELIMINARY REPORT

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FOR several years it was noticed at history taking that patients suffering from more seasonally occurring anorectal conditions like external thrombotic hemorrhoids, abscesses or poor healing of operative wounds had been neglecting the intake of citrus fruits and other vitamin C rich food.

More systematic questioning of all patients in this respect revealed that many of them had just discontinued or reduced their intake of vitamin C rich food during the last three to five weeks. Ascorbic acid 200 to 600 mg. daily, administered to these patients in addition to indicated treatment, seemed to improve their condition. The relation of vitamin C intake to some rectal disorders appeared, therefore, probable.

A regular check-up of the ascorbic acid plasma levels was therefore started on a number of patients falling into this group in 1949, with the intention of exploring the possibility of any connection of their variations with these manifestations.

The conception of normal ascorbic acid plasma levels and their variations differ somewhat with individual investigators.

Prunty and Vass after rather extensive tests on students of St. Thomas's Hospital Medical School conclude that 0.8 mg. constitutes saturation, and levels below 0.4 are undesirable. The time and dosage required for procuring saturation varies widely.

McMillan and Todhunter's tests on students show a tendency toward lower levels in Freshmen than in older students which may suggest higher requirements in the former. They found, furthermore, that the variations of the levels in the same individual on different days are mostly less than 0.19 per 100 ml.

The concept of normal range in some well known laboratory textbooks are: Todd and Sanford, 0.5 to 1.5 mg.; Kolmer, 0.7 to 1.4 mg. and Cantarow and Trumper 0.6 to 2.5 mg. (With optimum intake of vitamin C 1.0 and above.)

The importance of ascorbic acid in the vital economy of the body is characterized by Daldorf as an "essential nutrient required for normal deposition and maintenance of intracellular substances including collagen, alterations in the formation of which results in scurvy with increased capillary permeability and disturbance of bone and other cementum-forming cells" and "may have an influence upon antibody production and immunity to infection."

According to Kolmer, "Lack of vitamin C increases tendency to purpura and lowers resistance to infection."

In testing for ascorbic acid most investigators prefer the plasma level test. Cantarow considers the intradermal "Rotter" method with dichlorophenol-indophenol dye as a quick demonstration of deficiency but of questionable accuracy.

Much material has been accumulated regarding the effect of ascorbic acid medication in different pathologic conditions as tuberculosis, asthma, hayfever, and epilepsy. Mostly no relation could be established with a few exceptions.

Hartzel found that vitamin C deficiency in combination with low serum protein predisposes to wound disruptions.

McDevitt et al. found lowered resistance to postoperative shock in animals deficient in vitamin C and recommend its preoperative administration.

Wegemer and Buesing found a relationship between the seasonal increase of bacteriocidal properties of the blood and vitamin C increase in the diet.

Babbar concludes that there is an increased demand of ascorbic acid in different pathologic conditions, especially tuberculosis.

In general, however, very little conclusive evidence has been exhibited that the ascorbic

acid plasma level is significant in any concrete pathologic condition.

In the following presentation it is likewise not contemplated to establish conclusively a relationship between the ascorbic acid plasma level and the manifestations mentioned or even their progress. This preliminary report is meant merely as an interesting observation of the ascorbic acid plasma levels in anorectal conditions which seem to make their appearance more or less seasonally.

TABLE 1*

Disorder	No. of Patients
Acute external thrombosis	15
Subacute external thrombosis	4
Slow wound healing	2
Proctitis, mucosal bleeding	4
Ulcerative colitis, flare up	1
Abscess	1
Acute fissure	1
Total	28

* The average age of the twenty-eight patients was thirty-eight years; there were twelve females and sixteen males; twenty-seven were white and one was colored. In this group there were two patients with recurrent external thrombosis.

It may have occurred to all of us that we have seen in the office or outpatient department numerous external thrombotic hemorrhoids within a few days and then none for a month. Likewise, some postoperative wounds seem to heal better and more smoothly at certain times of the year and slower and less satisfactorily at others. We do not see abscesses in equal numbers all year around.

These observations prompted the investigation of the relation of season and ascorbic acid levels to these anorectal conditions.

The test was done wherever feasible on the patients falling into this group. The small number of cases does not permit any definite conclusions, but it may form a base for further observation in this direction. (Table 1.)

The patients received in addition to indicated therapy 200 to 600 mg. ascorbic acid daily. The response of the patients to this medication seemed gratifying in most cases, and pronounced improvement was noticed in several. Only two recurrent thromboses were observed in this series. Noteworthy are a few cases in which bleeding of the mucosa, without other apparent essential findings, was the outstanding symptom. Ascorbic acid deficiency was considered as etiologic in these cases only if after improvement with the vitamin consecutive repeated studies, including stool tests for occult blood, proved negative.

In these rather rare cases of unexplained bleeding in which history reveals preceding low ascorbic acid content of the diet the vitamin may be tried. This should, of course, not substitute for a thorough investigation and follow-up studies.

In one case the apparent discrepancy between findings and plasma level test prompted the differentiation of a spontaneous external thrombotic hemorrhoid from a thrombosis caused by an erroneous injection attempt of an external hemorrhoid by a practitioner. The patient presented himself with an apparent acute external thrombotic hemorrhoid which was excised. The ascorbic acid plasma level subsequently was found to be high and on further insistent interrogation the details of the aforementioned history, which the patient had not previously divulged, were revealed.

Numerous cases similar to those reported were seen in the last few years and treated satisfactorily with vitamin C. Observations, however, were only clinical; no blood tests were done.

It was not before this year that the laboratory in our hospital was prepared to perform the test at short notice, as the procedure is rather time-consuming, and the ingredients have to be freshly prepared each time.

The Farmer and Abt test was employed using dichlorophenol-indophenol and metaphosphoric acid 5 per cent. Our difficulty has been that it takes hours to prepare the solutions after which there is sufficient material for about ten tests. Naturally, only one was done at the time. I thought it was essential to do it right away. In fact, the patient received his prescription for ascorbic acid tablets immediately with instructions to start taking them as soon as his blood had been taken in the laboratory.

As most patients were ambulatory and from some distance, the difficulties were apparent.

In Table II the less usual lesions and climatic changes are mentioned. It appears from this table that abnormally low ascorbic acid plasma levels are encountered predominantly in early spring, less so in the heat of summer and further decrease in frequency in the fall.

Sudden changes of temperature seem to provoke acute exacerbations; recurrences were observed in extremely hot weather.

CONCLUSIONS

1. Low ascorbic acid plasma levels are encountered frequently in patients with some acute seasonally occurring anorectal conditions. This fact is most evident in early spring.

2. Ascorbic acid content of the blood might be a significant factor in unexplained mucosal bleeding.

3. Ascorbic acid medication appears to be a valuable adjunct in treating the conditions mentioned if the level is found low.

I believe this preliminary report is only a beginning in this direction and further investigation of other observers in different climatic sections of the country would be of value.

Addendum: Since this paper was prepared, an interesting article appeared in the *J. A. M. A.* of February 25, 1950. The paper was written by Charles Glen King at the request of the council for foods and drugs. Among other vitamin C deficiency symptoms the following are mentioned: slow healing of wounds, decreased capacity to combat infections, to metabolize amino acids and to maintain a normal collagen level, as well as inclination towards subcutaneous hemorrhages.

TABLE II

Case Findings	Ascorbic Acid Plasma Levels	Operative Therapy	Result	Preceding Weather	
1. Acute external thrombosis	0.03	Excision	Good	Few warm days after cold	Early Spring
2. External thrombosis	0.4	None	Good	Average	
3. Acute external thrombosis	0.15	Excision	Good	Cold, warm after	
4. Acute external thrombosis§	1.8	Excision	Fair	1st, hot wk. after cold	
5. Acute external thrombosis	0.5	Excision	Good	Cool after hot	
6. Pruit, acute thrombosis	1.2	Excision	Fair	Cool after hot	
7. Small external thrombosis	1.5	None	Average	Average	Hot Summer
		Excellent improvement during 2 cold nights			
8. Acute exacerbation of ulcerative colitis	0.5	None	Exacerbation in 1 wk. after heat and humidity		
9. Fistula and acute external thrombosis	0.2	Fistulectomy	Good	After heat and humidity	
10. Acute perirectal abscess	0.5	Excision	Excellent	4 hot days after cool	
11. Postoperative slow healing	0.83	Excision	Good	Hot, humid	
12. Postoperative slow healing	0.5	Excision	Good	Hot, humid	
13. Proctitis, bleeding*	0.6	Excision	Excellent*	Hot, humid	
14. Acute, large, external thrombosis	0.3	Excision	Excellent	3 cool nights after hot	
15. Acute external thrombosis	0.4	Excision	Good	3 cool nights after hot	
16. Acute external thrombosis†	0.42	Excision	Not satisfactory*	Cool weather after hot	
17. Acute fissure‡	0.63	Excision	Not satisfactory‡	3 hot days after cool wk.	
18. Small acute external thrombosis	0.5	None	Good	Cool 2 wk.	
19. Proctitis bleeding*	0.83	None	Excellent*	Cool 2 wk.	
20. External thrombosis internal hemorrhoids	0.91	Hemorrhoidectomy	Fair	Cool	
21. Acute external thrombosis	0.45	Excision	Good	Cool	Moderate Fall
22. 2 small external thromboses	1.14	None	Fair	Average	
23. Acute proctitis, bleeding*	0.68	None	Excellent*	Humid after 5 dry	
24. Acute external thrombosis	0.6	None	Good	Cool, comfortable	
25. Multiple fissure, proctitis, bleeding*	0.7	None	Good*	Cool, comfortable	
26. 2 external thromboses, internal hemorrhoids	1.25	Later	Fair	Cool, comfortable	
27. Acute external thrombosis	0.94	Excision	Good	Cool, comfortable	
28. Acute large external thrombosis	1.07	Excision	Good	Cool, comfortable	

* Disappearance of blood in four to seven days; occult blood negative after nine to twelve days. Three were checked up two or three months later, no apparent recurrence so far.

† Recurrent in a few days.

‡ Small thrombosis two weeks later.

§ Artefact mentioned in text.

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DISCUSSION

T. A. Krolicki (Providence, R. I.): Dr. Scheffler's presentation is additional evidence of the avenues that are open for investigation to alert and progressive proctologists. This is Dr. Scheffler's preliminary report of an interesting observation in history taking. He wisely makes deductions; however, he establishes no definite conclusions as to the relationships between ascorbic acid plasma levels and the manifestations mentioned. A review of the major element under consideration seems pertinent.

Ascorbic acid was first known as cevitamic acid and presently as vitamin C or the antiscorbutic vitamin. It is a water-soluble vitamin that is necessary in the prevention and cure of the deficiency disease, scurvy. Historically, the time elapsing between the recognition of scurvy as a specific disease entity by the ancient Greek physicians and the development of the modern concept of the illness as a vitamin deficiency state covers a span of many centuries. Hippocrates as early as 400 B.C. described the clinical picture of vitamin C deficiency. For reasons now obvious the malady wrought its greatest devastation in times of war and famine, among inmates of prisons and most of all among seafaring men. Among these latter the disease became a veritable scourge as the range of sailing ships increased and voyages became matters of months and years during which the sailors were deprived entirely of fresh vegetable foods. Even in more modern times when through blockage or siege fresh vegetable foodstuffs have become unobtainable, the disease has been known to ravage whole populations. Half the defending garrison of 17,000 men were found to be stricken with the complaint after the siege of Port Arthur during the Russo-Japanese war[1] while in the World War of 1914 to 18 the disease became widely prevalent in Austria. At the present time, apart from privation enforced by war conditions, the disease appears to be most rife among certain backward nations, notably the natives of South Africa and the aborigines of Central Australia.

In 1720 Kramer,[2] having observed that available medicines gave no relief from scurvy, drew attention to the antiscorbutic value of juices prepared from citrus fruits. By the administration of such preparations he assured his readers, "You will, without other assistance, cure this dreadful evil." Some thirty years after Kramer had provided this practical approach to the treatment of the malady, Line,[3] a British naval surgeon, proved conclusively the antiscorbutic value of oranges and lemons. No radical advance in the knowledge of this subject

was made until the beginning of the present century. In 1907 Holst and Frohlich[4] took advantage of the fact already indicated by Theobald Smith[5] in 1895 that the condition could be produced in guinea pigs by excluding green vegetables from the diet. This discovery served the twofold purpose of providing an experimental animal for study of the condition and of furnishing the means by which a method of biologic assay could be evolved. Further investigations led to the discovery that it was seemingly impossible to produce vitamin C deficiency in certain other animals such as rats, mice and rabbits presumably due to their ability to synthesize their ascorbic acid requirements. Thousands of pounds of the vitamin are now synthesized annually for addition to dietary foods and pharmaceutical preparations.

Vitamin C is found in all living plant cells, is synthesized during the germination of seeds and is relatively concentrated in the rapidly growing parts of the plant. It is present in all animal tissues as well, but only guinea pigs, the primates and man are unable to meet body needs by synthesis and must rely upon a dietary source. In the animal ascorbic acid is not stored in large amounts but is present in relatively low concentration except in the thymus and pituitary. High levels of the vitamin appear to be associated with tissues of high metabolic activity.

The biochemical reactions in which vitamin C plays a part have not been elucidated; however, it is known to be essential for the formation of intercellular collagen. In scorbutic tissues the amorphous ground substance and the fibroblasts in the area between the cells appear normal but without the matrix of collagen fibers. These bundles of collagenous material appear within a few hours after the administration of ascorbic acid. This points to the relationship of the vitamin in maintenance of tooth structures, matrix of bone and the walls of capillaries. In vitamin C deficiency these are the tissues found to be faulty.

It is not my intent to discuss here the nutritional changes of the past decade which amongst other factors show a downward trend in the incidence and mortality rates of infectious diseases. The forward march of medicine in prophylaxis and in therapy show that there is another unidentified prophylactic factor which as hypothesized by many investigators is nutritional. The unidentified factor[6] is vitamin C. It appears in all living tissue, but our best source of supply are fresh fruits such as citrus fruits, strawberries and currants, and green vegetables such as lettuce and cabbage. As previously noted and as Dr. Scheffler mentions vitamin C is curative in scurvy, in some scorbutic types of bleeding and plays a major role in wound healing. It also has some relation in anti-infection.

Vitamin C has been dubbed the "commando vitamin" because of its value for increasing physical endurance,[7] delaying the onset of fatigue and enhancing work capacity.[8]

Laboratory studies and clinical observations[9–12] indicate that gastrointestinal diseases or dysfunctions loom large in vitamin C deficiency group. Administration of vitamin C is helpful both as a prophylactic and as a therapeutic measure in certain types of dysenteries. The physiologic action of vitamin C in relation to its "anti-infection" role[6] and in the prophylactic and therapeutic use of this vitamin in infectious diseases is accepted. There is no agreement on the requirement of vitamin C in man. The various Nutritional Committees in the United States and the League of Nations are not in unanimity on the required daily dose. Dr. Scheffler has mentioned the experimental tests performed by Prunty and Vass, and McMillan and Todhunter.

The etiology of external thrombotic hemorrhoids, fissure, fistulas and abscesses is generally agreed upon by most proctologists. The etiology of proctitis and the colitides is controversial. It behooves the clinician to utilize the accepted methods of treatment. The utilization of various adjuncts and especially ascorbic acid in certain seasons as Dr. Scheffler concludes will perhaps help clear the condition quicker.

Intentionally I have not mentioned anything about the tests for ascorbic acid. The several laboratories with which I have conferred inform me that the ascorbic plasma level tests are special technical tests and as Dr. Scheffler mentions require daily preparation of special reagents. This is time consuming. Investigative problems may be of a minor consideration today; however, after thorough investigation and proper evaluation tomorrow may be of importance.

Elmer E. Wadsworth (Alhambra, Calif.): Since Dr. Scheffler asked for the opinion of men in other parts of the country who do not have the seasonal changes, we are attempting to give him ours:

In California we do not have the seasonal changes and we have an abundance of citrus fruits. Although we have realized for years that the presence of sufficient ascorbic acid has a definite relationship to the healing of wounds and we do use it routinely in surgical procedures of any major importance, there has been absolutely no evidence clinically that it is connected with the development or is an etiologic factor in the development of abscesses or the ordinary thrombotic hemorrhoid.

It seems rather that we have more common causes of that common pathologic condition, i.e., straining and infection. I think Dr. Scheffler is to be commended on singing that hymn again, as Dr. Harding brought to our attention, the importance of adequate vitamin C in the healing of wounds. However, I do think that his clinical conclusion certainly would bear further investigation.

Case Reports

MULTIPLE POLYPOSIS IN AN INFANT OF FOUR MONTHS

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MULTIPLE polyposis is recognized as a distinct but rare disease which occurs in certain families. It has been described under various names such as multiple polyposis, multiple adenoma, hereditary polyposis, etc. The polypi are true polyps, or tumors, in varying stages of development from small sessile adenoma to large pedunculated polyps. They are not to be confused with inflammatory polyps or the occasional isolated polyps found in certain individuals. Most authorities believe there is an inherited predisposition to the development of epithelial proliferation and subsequent polyp formation in the colon and rectum of these individuals and that it becomes manifest between puberty and middle life but that the disease does not exist at birth. This genetic defect resulting in the abnormal proliferation of intestinal epithelium has been demonstrated to be not only a familial defect but also is considered by many to enhance the development of malignant degeneration or carcinoma in these polyps.

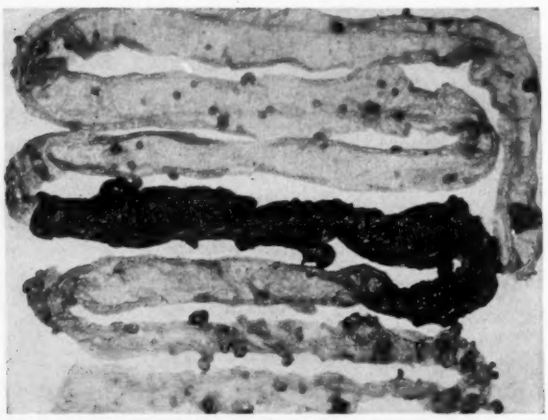

FIG. 1. This is a dissection of the gastrointestinal tract; at juncture of duodenum with jejunum are found a large number of polyps of varying size. Discolored area is an intussusception. Note polyp in mid-part which apparently was the lead of intussusception. Polyps are most numerous in colon and rectum.

The symptoms of multiple polyposis are progressive. Severe rectal bleeding, diarrhea, loss of weight, low abdominal pain and tenesmus are observed. The diagnosis of multiple polyposis depends upon complete proctologic and radiographic examinations. Contrast air studies are helpful.

An extensive review of literature in the field fails to reveal any report of a child having had polyposis at the time of birth. Dixon[1] reported two infants, each eighteen months of age, as having the disease, and according to Turell[2] these are probably the youngest recorded patients. McKenney[3] reported a case in a boy two years of age with a brother and a sister who also had multiple polyposis. Each child was approximately two and three-fourths years apart in age; and from the growth rate noted from the difference in size of the polyps in these children, McKenney concluded that the two-year-old child must have been born with the disease in order to have had polyps the size noted.

The purpose of this paper is to present what we believe to be the youngest case of multiple polyposis on record, and to show how this child must have been born with the disease to have polyps the size described and demonstrated.

CASE REPORT

A four month old male infant was admitted to the Children's Hospital at Denver, Colorado, in January, 1949. History revealed a normal birth on September 18, 1948, with normal development and weight gain up to thirteen pounds in early December, 1948. At this time it was noted that the child was losing weight and had developed a moderate degree of constipation for which various laxatives were prescribed. Constipation was persistent, and the patient began having bloody stools and what was described as a rectal prolapse. It was for the

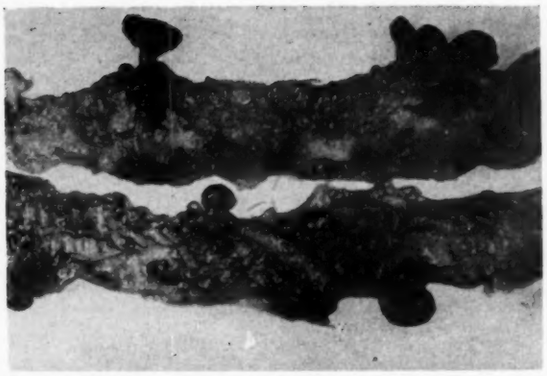

FIG. 2. This is a close-up of section of the colon. Note size of polyps in this area. Color varied from deep red to bluish red. There was evidence of trauma to congested mucous membrane covering the polyps.

FIG. 3. This shows section of gastrointestinal tract with intussusception intact.

latter condition that the patient was admitted to Children's Hospital. Physical examination at the time of admission revealed a four month old child weighing 11 pounds, 5½ ounces. He was acutely ill, markedly dehydrated and extremely undernourished. Lymph nodes were negative. The abdomen was distended but no masses were palpable. Laboratory findings at this time were negative except for a marked anemia, 31 per cent hemoglobin. Gastrointestinal x-ray series were reported negative. However, a barium enema using contrast air technic revealed multiple polyps throughout the colon from the rectum to hepatic flexure. Most of the polyps were observed in the distal two-thirds of the colon and were about 1 cm. in diameter. A diagnosis was then made of multiple polyposis of the entire colon.

On February 8, 1949, a complete proctologic examination was done. Polyps could be palpated digitally and two polyps could be seen prolapsing from the anal orifice, probably accounting for the rectal prolapse noted earlier. Sigmoidoscopic examination revealed many polyps of varying size from the anal orifice for a distance of approximately 5 inches. Radical surgery was advised for the future, with immediate treatment consisting of fulguration of those polyps within reach of the sigmoidoscope. It was believed that this procedure would help control hemorrhages and the recurring prolapse of the rectum. On February 12th, 25th and March 14, 1949, several polyps were removed and the bases fulgurated. Following surgery the patient's course was rapidly downhill, with considerable loss of blood from the rectum and the development of signs of intestinal obstruction. An x-ray of the abdomen revealed an obstruction which was resistant to Wangensteen drainage and rectal tube. The patient expired on March 16, 1949.

Autopsy findings were as follows (Figs. 1 to 3): (1) Intussusception of the mid-portion of the ileum into the terminal ileum with infarction and gangrene of the bowel; a large polyp was found at the mid-part of the infarcted area and was apparently the lead of the intussusception. (2) Beginning at the juncture of the duodenum with the jejunum there was a large number of polyps of varying size, from the sessile to pedunculated types. These became quite numerous in the ileum. The colon and rectum also showed large numbers of polyps varying from 0.3 cm. to 2.5 cm. and were most numerous in this part of the gastrointestinal tract. The number of polyps present was approximately 170. (3) Peptic ulcer of the second portion of the duodenum; microscopic findings revealed no anaplastic changes in any of the polyps.

CONCLUSIONS

The conclusions reached in the above case are as follows:

1. That this is the youngest case of multiple polyposis on record to our knowledge.

2. With the evidence of the autopsy findings, together with the accompanying microphotographs, it is hard to conceive how these polyps could have attained such size in only four months. We believe, therefore, that these polyps must have been present prior to the birth of this child and that he was born with multiple polyposis.

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RADICAL SURGICAL TREATMENT OF CHRONIC ULCERATIVE COLITIS*

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IN a patient with complicated chronic, non-specific ulcerative colitis the establishment of a permanent ileostomy is no longer considered an unendurable handicap, but coupled with total colectomy it restores these individuals to a useful and enjoyable life. The more generally accepted indications for surgical treatment[2] in this disease are: (1) extensive perianal infection with fistula formation; (2) stricture of the anus, rectum or colon; (3) polyposis; (4) carcinoma; (5) perforation with abscess formation and (6) extensive systemic disease, particularly rheumatoid arthritis. The more debatable indications are: (7) segmental disease[1,3] and (8) intractability under medical treatment (including recurrent hemorrhage† or incontinence of the anal sphincters).[1,3] The most debatable is (9) acute fulminating disease.

The indications for surgical treatment of the patient described herein were: (1) anal incontinence for six years in the presence of frequent stools, (2) anal and perianal ulceration, sinus formation, destruction of the perineal body and beginning destruction of the rectovaginal septum, (3) polypoid degeneration of the colon and rectum of five years' duration and (4) stricture of the sigmoid.

This patient has been under my care since the condition manifested itself in March, 1940, at the age of twenty, as a fulminating suppurative disease in the anorectal and perianal regions, through a successful three-stage procedure consisting of ileostomy, subtotal resection of the colon and abdominoperineal resection of the anus, rectum and sigmoid carried out in approximately a five-month period from November 15, 1948, to April 23, 1949.

CASE REPORT

L. P., a twenty year old white female, was first admitted to the hospital March 4, 1940, because of severe perianal and perirectal suppurative disease, accompanied by high fever, resulting in abscess formation. Negative results were reported in tests for gonorrhea, syphilis, lymphopathia venereum and amebiasis. In August, 1940 (five months after onset) a fistulotomy was done. The fistula was complicated by a deep sinus extending into the rectovaginal septum. A diagnosis of atypical chronic non-specific ulcerative colitis was first made in December, 1940, on the basis of proctoscopic findings and the above mentioned laboratory results. In March, 1941, conservative anorectal surgery was done for multiple sinuses and large skin tags. Not until April, 1943, did the usual two formed stools increase to six to eight thin stools during the day and none to three at night. Blood and mucus in the stools and anal and perianal ulceration became apparent at this time. An abscess in the right anterior perianal quadrant was incised and drained in July, 1943. During that month the patient reported nearly daily chills and fever of 103° to 104°F. Her weight reached a minimum at this time, 146 pounds instead of her usual 165.

In March, 1945, radical surgery was advised because of frequent stools, ulcerative disease of the rectum, anus and perianal region, anal incontinence and x-ray diagnosis of ulcerative colitis with polypoid disease. Near the close of the sixth year of the disease the patient was delivered of an illegitimate full term female child. During pregnancy there was no apparent change in the disease. In November, 1947, the patient was again urged to consider seriously radical surgical treatment. A year later, November 15, 1948, at the age of twenty-nine, a single barrel ileostomy was performed. On January 22, 1949, subtotal resection of the colon was done. Three months later, April 23, 1949, abdominoperineal resection was accomplished. In another three months she resumed work as an office employee. Within another three months, eleven months after ileostomy, she was married.

The following notes are from the x-ray reports of Dr. James T. Case who examined the colon roentgenologically on three occasions:

"January 19, 1944: The patient has a highly irritable colon with typical findings of ulcerative

* From the Stritch School of Medicine of Loyola University and the Department of Surgery, South Shore Hospital, Chicago, Ill.

† Ault (and others) consider surgical treatment contraindicated here.

colitis and polypoid formation. These latter are found particularly in the transverse and descending colon.

"April 11, 1946: The colon is marked by shortening and the universally present evidence of the colitis.

"March 5, 1948: The colon is considerably shortened and the walls quite rigid. With all of our manipulations there is no bleeding. This would suggest a pericolitis rather than an intrinsic colitis. The narrowing in the colon lying opposite the crest of the ilium may be due to induration of the pericolic tissues rather than a process within the bowel itself. Incidentally, we note that the spleen is of larger size than the liver."

These notes are from the pathologic reports of Dr. John F. Sheehan who examined the surgical specimens:

"Specimen No. 9479 (January 22, 1949). The specimen consists of a 40 cm. segment of colon including the cecum and appendix and the terminal 22 cm. of ileum.

"Microscopic diagnosis: Diffuse chronic colitis and pericolitis with multiple benign polyps and healed ulcers. Chronic ulcerative appendicitis. The terminal ileum is essentially negative.

"Specimen No. 9773 (April 23, 1949). The specimen consists of two 18 cm. segments of bowel. One includes the anus and rectum, the other is sigmoid colon. The normal mucosal folds are absent, the surface is nodular and in areas it is ulcerated. A few polypoid structures are present, the largest measuring 1.7 by 1.5 by 1.5 cm., and another is 2.5 cm. in length. The anus is not recognizable as such.

"Microscopic diagnosis: Chronic ulcerative colitis with pseudopolyps. Chronic ulcers of the anus and perianal skin."

COMMENT

For more than nine years this young lady suffered from a progressive destructive infection of the large bowel causing loss of sphincter function, perineal body and part of the rectovaginal septum, necessitating the constant wearing of a perineal dressing. Contemplating marriage and being the mother of a two-year old daughter, her decision to submit to a three-stage operation of considerable magnitude involving a permanent ileostomy, is evidence of the unsatisfactory and burdensome existence which she was no longer willing to endure. Such patients should be encouraged to accept the risks of necessary surgery in anticipation of cure from an incapacitating and life threatening disease before irreparable damage has been done.

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MALIGNANT MELANOMA OF THE RECTUM

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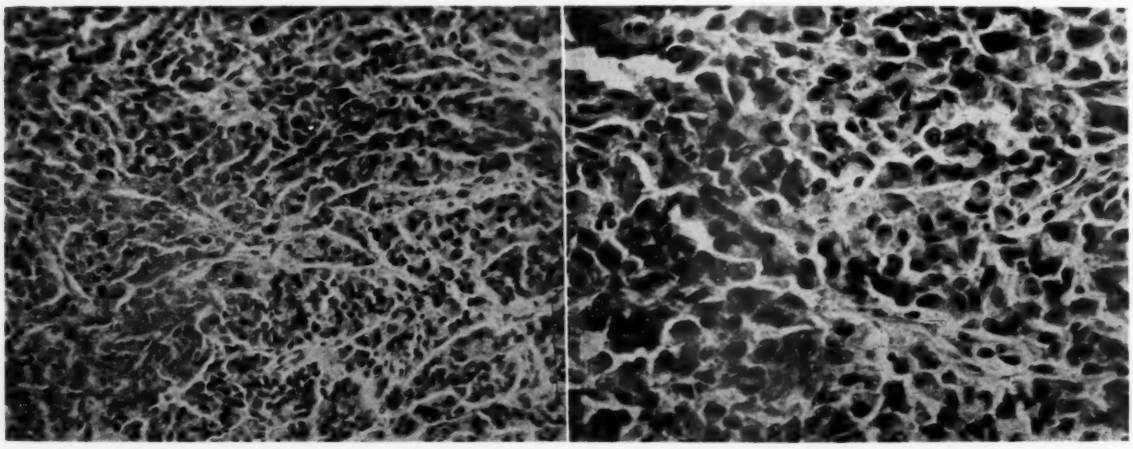
Los Angeles, California

AT the meeting of the American Proctologic Society in 1949 it was mentioned that few cases of malignant melanoma of the large bowel have been reported. The following case of this type is the only one that the author has seen in over twenty years in proctology.



1 2

FIG. 1. Columns of oval- and spindle-shaped melanoma cells. There are numerous mitoses.
FIG. 2. High power detailed view from Figure 1.

CASE REPORT

A housewife, aged fifty-three, was seen on September 28, 1942, because of bleeding from the rectum, pain in the rectum and a large protrusion from the anus. The patient stated that she had had these symptoms for three months, that these symptoms were aggravated upon defecation, and that her physician was giving her injection treatments for hemorrhoids. There was no family history of malignancy and her past history was of no importance.

The patient was rather obese, 5 feet 4 inches in height and weighed 170 pounds. Physical examination revealed no abnormalities. Rectal examination revealed a polyp 1½ inches in length attached to an interno-external hemorrhoid on the left side of the anus; this polyp could easily be brought out of the anus digitally.

The patient was sent to the Cedars of Lebanon Hospital, and the polyp and hemorrhoid were excised under sacral block anesthesia. She made an uneventful recovery and was discharged from the hospital on October 5, 1942.

At the time of operation the polyp was crushed somewhat when it was grasped with an Allis forcep and the center was seen to be made up of gray core, hence a condition other than simple polyp was suspected.

The pathologic report at first was melanoma, but upon closer study a diagnosis of melanosarcoma was made. (Figs. 1 and 2.) On October 22, 1942, a small piece of tissue was removed from the healing wound for microscopic study; the pathologist reported granulation tissue only.

Locally, the patient appeared cured. However, on November 14, 1942, she complained of pain in the chest and was referred to an internist who found some dullness and tenderness on pressure over the manubrium sternum, and also reported that "fluoroscopy of chest reveals no pathology in lungs or heart; radiograph of chest shows no abnormalities."

This patient was not seen again. It was learned that on January 13, 1943, she was admitted to the Los Angeles County General Hospital, complaining of generalized pain, dyspnea and a productive cough of three months' duration; also that she had noticed a lump in the sternum for three months. Examination revealed a large lump over the manubrium sternum, the entire left lung field flat to percussion with decreased tactile fremitus and breath sounds, a palpable irregular and tender liver two finger-breadths below the right costal

margin; large chestnut-sized nodules in the right axilla and palpable nodes in the inguinal areas. Rectal and urine examinations were negative; blood count was normal. Biopsy from a left inguinal node was reported as a metastatic malignant melanoma. X-ray of the sternum showed a partial destruction of the manubrium; x-ray of the chest revealed a massive pleural effusion. Five thoracocenteses were performed with removal of large amounts of fluid. The patient's course was steadily downhill and she expired March 3, 1943.

SUMMARY

A case of malignant melanoma is reported. In spite of a local cure this case reveals how rapidly these growths metastasize and spread throughout the entire body.

ANORECTOVAGINAL FISTULA

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South Bend, Indiana

THIS case illustrates an unusual complication from anorectal infection. Secondly, it again demonstrates the successful use of the "flap operation" as recently described by Laird[1] for the cure of rectovaginal fistula. (Fig. 1.)

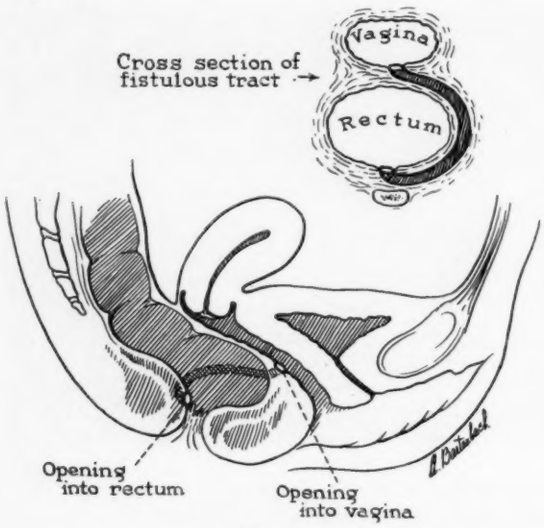

FIG. 1.

CASE REPORT

A white female, age thirty-three, was referred by her physician in June, 1949, because of a foul vaginal discharge of three weeks' duration. Her trouble began with severe rectal pain which was relieved on the sixth day following a forceful gush of foul smelling pus from the vagina.

She had had no previous rectal or vaginal complaint. Bowel habits were normal. She gave no history of pelvic disease or pregnancy. There was no evidence of possible tuberculous infection in the family or personal history. X-ray examination revealed a normal heart and lungs. General physical examination was negative and the patient was robust and well nourished.

The anorectal examination was of special interest. Just to the right of the posterior midline in the anal canal at the mucocutaneous level was a prominent sinus opening which would easily admit a large probe. The sinus contained a mucopurulent discharge. Just to the right of this point was a large anal papilla about 1.5 cm. long. By palpation a prominent cord-like induration could be identified, beginning from the sinus opening posteriorly and extending around the entire left rectal wall about 2.5 cm. above the anal canal. It terminated anteriorly in the midline of the rectovaginal septum about 4 cm. above the dentate margin. The rectal mucosa was intact and moderate mucous hemorrhoids were noticed. Sigmoidoscopy was negative to 25 cm.

Vaginal examination revealed an indurated area in the posterior midline almost midway to the cervix. Inspection showed this area to contain a discharging sinus with a thin purulent drainage. A curved probe could be passed into the sinus a distance of 1.5 cm. No scars were present to indicate a previous pathologic process or surgical procedures.

Operation was recommended and the patient submitted eight weeks later. Periodic examinations during this interim showed no change in the findings. Blood cell count and urine analysis were normal on admission to the hospital.

Spinal anesthesia was used with the patient in the prone position. (Figs. 2 to 4.) The sinus tract was easily followed with a large probe beginning at the posterior anal opening. The entire fistula tract was incised to the rectovaginal septum where the probe passed easily through the secondary opening into the vagina. Here the opening was enlarged longitudinally so as to admit one finger freely for the purpose of good drainage. The wound encircled the entire left rectal wall and involved the submucosa. The sinus tract was composed of the usual granulation tissue with a dense fibrous wall.

Next, the anterior wall of the rectum was mobilized for a distance of 5 cm. The mucosa adjacent to the anterior portion of the sphincter was dissected away. The rectal flap was then sutured to the superior portion of the external sphincter with interrupted catgut sutures. The edges of the wound of the fistula tract were trimmed away. The hemorrhoids were removed by ligation and radial excision as was the enlarged papilla in the right posterior quadrant. The incised linear wound on the vaginal side of the septum was inspected and left open to heal by granulation.

Four hours later the patient was returned to surgery because of persistent vaginal bleeding. Under gas anesthesia the edges of the wound were sutured to control the bleeding but care was taken not to close the wound. The patient then made an uneventful recovery.

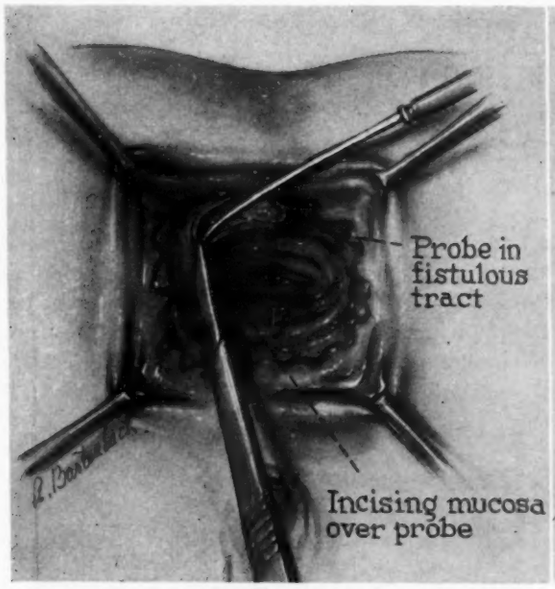

FIG. 2.

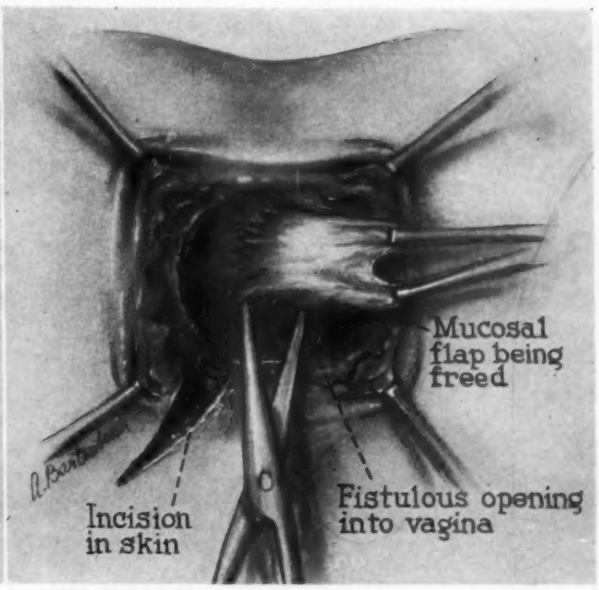

FIG. 3.

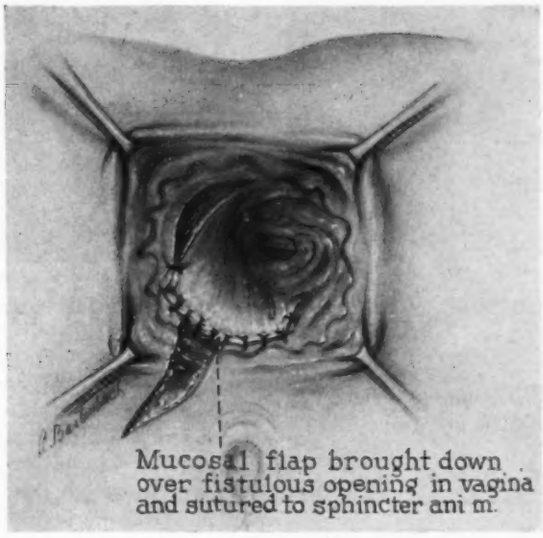

FIG. 4.

Microscopic examination of granulation tissue from sinus showed non-specific inflammatory changes. All wounds were completely healed in three weeks and there has been no recurrence to date.

SUMMARY AND CONCLUSIONS

1. This case illustrates how an anal infection produced an anorectovaginal fistula.

2. This condition was cured by fistulotomy and repair of the rectovaginal fistula by use of the "flap operation" in one stage.

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HYPERNEPHROMA OF THE SIGMOID COLON

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METASTASES to almost every organ of the body by hypernephroma (so-called Grawitz tumor) has been reported. Nowhere in the literature could an instance be found in which metastasis to the mucosa of the colon had been reported, al-

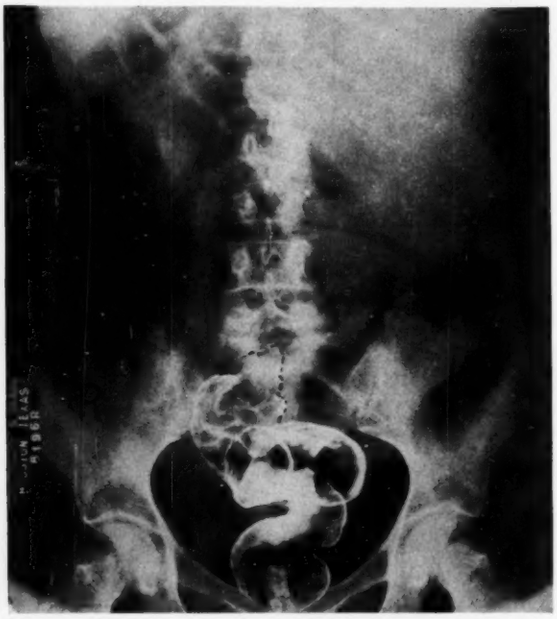


FIG. 1. Barium enema with obstruction to barium in sigmoid colon.

though extramural involvement of the colon in such a tumor mass has been recorded.[1]

CASE REPORT

Mrs. B. K., white, sixty-nine years of age, was first seen on August 16, 1949. She complained of abdominal cramps relieved on passage of gas or stool, some distention, and for the past month or so had noticed blood and "corruption" mixed with the stool. Strong laxatives were necessary in order to have a stool.

There had been a gradual weight loss of 60 pounds in the past two or three years. Her present weight was 130 pounds. Her father died of tuberculosis at the age of fifty and her mother died at eighty-five of "old age." The remainder of the history was unimportant.

Examination was essentially negative except for a large, firm mass in the left upper abdomen that was thought to be distended colon. Proctoscopic examination was negative for a distance of 7 inches. Blood pressure was 150/88.

The laboratory findings were normal except for a hemoglobin of 11 gm. which became 13 gm. after

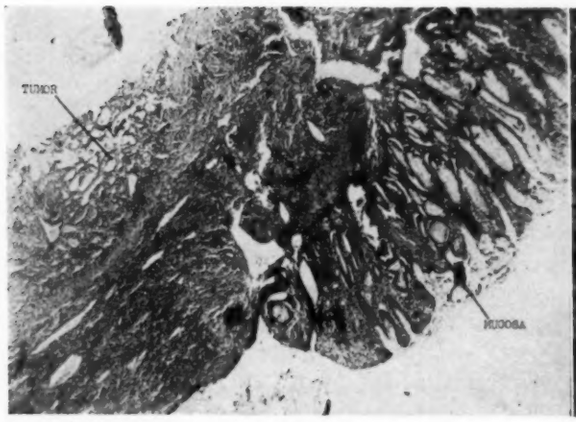
FIG. 2. Portion of resected sigmoid with attached tumor; A, is fat; B, mucosa; C, tumor.

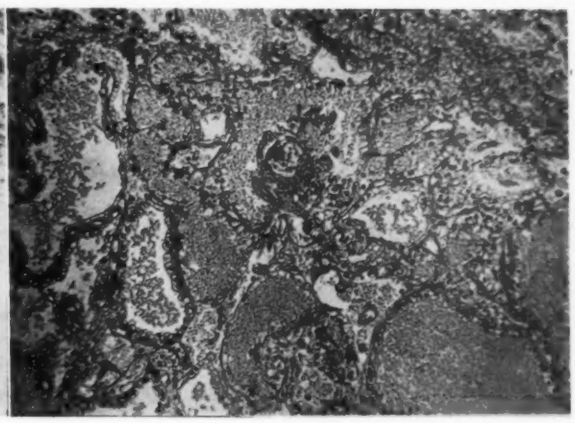
3 pints of blood were given. In addition, another 2 pints of blood were given on the operating table.

Barium enemas showed complete obstruction to the barium and to injected air in the mid-sigmoid. (Fig. 1.)

After thorough decompression of the colon, operation was performed on August 24, 1949. The mass felt on examination was found to be a huge tumor of the left kidney. The left colon was flat, freely movable, and in no way involved in the kidney tumor. In the mid-sigmoid an intraluminal, movable, polypoid growth was felt apparently filling the entire lumen. The serosa of the sigmoid at the site of attachment of the polyp showed no sign of involvement. The right kidney was felt and found to be twice normal size and covered with irregular nodules of varying size. There were no metastases felt on the surface of the liver nor were there nodules or metastases felt anywhere else in the abdomen. The polypoid mass in the sigmoid together with 21 cm. of bowel were resected and an end-to-end anastomosis performed. Convalescence was smooth and uneventful.

The polyp was found to be lobulated, firm, of a





3 4

FIG. 3. Low power section of tumor attached to mucosa.
FIG. 4. High power section of tumor.

purplish color, and with a fairly smooth surface that was covered with a grayish membrane. It was movable and attached only to the mucosa by a base 2 cm. in diameter, projected from the mucosa for 3 cm. and measured 4.5 cm. in greatest diameter. (Fig. 2.)

The pathologist reported the tumor to be a carcinoma, metastatic from a hypernephroma of the kidney. This opinion was shared by the Head of the Pathology Department of Baylor University College of Medicine. Following is the report:

"Section reveals the mucosa of the large intestine in one region. There is present beneath this, abundant hemorrhage and numerous inflammatory cells. Part of the surface is necrotic with a thick layer of pink-staining, structureless material and colonies of bacteria near the surface. Granulation tissue is abundant deep to this. Also present are spaces lined by cuboidal epithelium with clear cytoplasm. For the most part these have a regular arrangement, but in places are grouped without acinar arrangement. The nuclei are irregular in outline, in general are rounded. This has the appearance of the so-called 'clear cell carcinoma' (hypernephroma). (Figs. 3 and 4.)

"Diagnosis: Colon: carcinoma, probably from kidney. Extensive necrosis and hemorrhage of the polypoid mass."

During convalescence a chest x-ray and an intravenous pyelogram were done. The former showed no metastases. The pyelogram showed a good function bilaterally, confirmed the presence of kidney tumor on the left, and showed what appeared to be polycystic disease on the right. (Fig. 5.)

COMMENT

This case is considered unusual because of a solitary metastasis of hypernephroma to the mucosa of the sigmoid colon. No other metastases were found. It is unusual because of the presence of hypernephroma of one kidney and an apparent polycystic disease of the other kidney. This latter diagnosis might be questioned because patients with polycystic disease rarely live to be sixty-nine years of age, plus the fact that good kidney function was still demonstrated. This might be a bilateral hypernephroma as has been reported.[2]

FIG. 5. Intravenous pyelogram; both kidneys outlined.

Metastasis of hypernephroma to the mucosa

of the sigmoid colon cannot be explained. A possible route is through the vertebral veins as described by Batson.[3] These veins lack valves and communicate with the renal, portal and peripheral circulation. Increase in intra-abdominal pressure may dislodge tumor thrombi and produce paradoxical metastases which by-pass the pulmonary, portal and caval circulations.

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SACROCOCCYGEAL DERMOID*

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ALTHOUGH dermoid cysts of the ovary are not too uncommon, true dermoids of the pelvic connective tissue are exceedingly rare. They appear chiefly in women during the child-bearing period. Only six reported instances of true dermoid of the pelvic connective tissue in the male subject have been found in the literature. The term, "dermoid cyst," has a restricted application to a group of tumors composed of monodermal tissue in contradistinction to tridermal teratomas, or the more complex dermoids. (Fig. 1.) It is probable that they originate in misplaced ectoderm during the formation of the anus and rectum from the proctodeal membrane and the neurenteric canal.

CASE REPORT

A well developed and well nourished Caucasian woman, aged forty-four, was admitted to the White Memorial Hospital on October 23, 1949, complaining of rectal symptoms of about one year's duration. At the onset the symptoms consisted of discomfort and pain, with a feeling of constant fullness at the rectal outlet. Later a feeling of pressure was experienced at the time of bowel movement associated with pencil-like stools. She had constipation for a number of years prior to the onset of these symptoms and frequently had resorted to enemas and various laxatives in order to produce a bowel movement every one or two days. Six months before admission to the hospital the patient had a Frei test on the advice of her family physician who thought her symptoms were the result of a stenosis of the anal outlet due to lymphogranuloma venereum. The test proved negative. During the five weeks before hospitalization she had noticed a persistent feeling of fullness with pressure in the rectum as well as excessive flatus and bloating. Two weeks prior to hospital admission the symptoms had become progressively worse; she expressed a feeling of complete exhaustion with extreme nervousness, not benefited by sleep. However, at no time had she noted any loss of weight or change in bowel habits. A few days before she submitted to a proctologic examination she had noticed some blood-tinged mucus following every bowel movement.

Early in her youth the patient had a severe fall which injured her coccyx and pelvic region. Since then she had suffered tenderness and occasional pain whenever pressure was applied to the area of the coccyx while sitting. Otherwise her general health had been good. A note of importance concerning her familial history is that her mother died at the age of forty-eight of cancer of the rectum. There had not been any recent changes from her normal menstrual interval, its duration or amount of flow. Four years ago she had given birth to normally developed twins. Prior to that time she gave birth to one stillborn infant, and another infant which had died at seven months of renal disease. During physical examination the patient manifested evidence of apprehension, emotional stress and nervousness, but without expression of acute pain. The head and neck apparently were normal. The heart was within normal limits and abnormal arrhythmias were not noted. The chest was clear with normal excursions of inspiration and expiration. The abdomen had slight adipose fullness. There were no abdominal scars. Neither special tenderness nor

FIG. 1. The lining of a true simple "dermoid cyst" is composed of monodermal epithelial tissue in contradistinction to tridermal teratomas or more complex dermoids.

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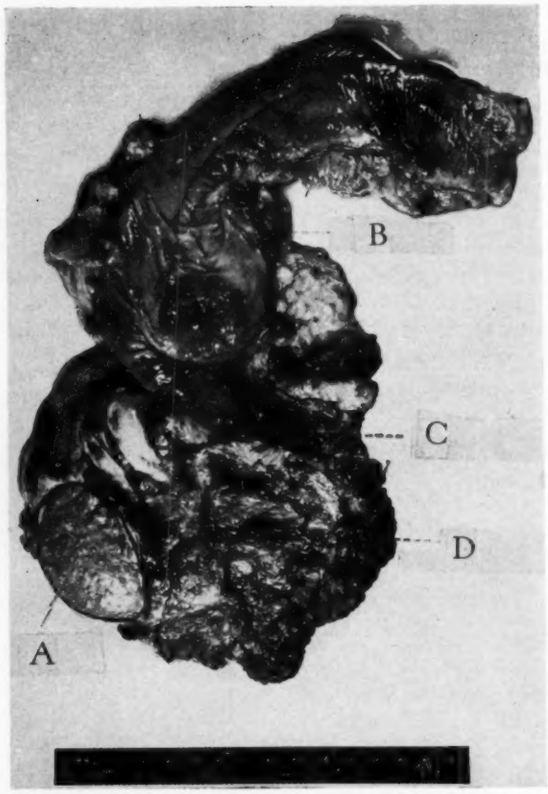

FIG. 2. This view presents the relationship of the rectum, anus and dermoid cyst with comparison of actual size. A, dermoid cyst; B, rectum; C, anal canal; D, ischio-anal adipose tissue.

masses could be detected on deep palpation. The blood pressure was 145 systolic and 88 diastolic.

On digital rectal examination the superior portion of the coccyx was palpated as very prominent with a definite deformity of the tip which was bent backward and upward. A nodular indurated area was readily palpable at the level of the insertion of the levator ani muscle in the left posterior quadrant, approximately 1.5 cm. above the mucocutaneous junction. This nodule felt like a small lima bean located just submucosally without attachment to the underlying tissue. Continuing to the midline posteriorly and to the right a much larger boggy mass was encountered as the tip of the coccyx was approached. This mass had its greatest diameter in the right posterior quadrant and extended cephalad practically the full length of the finger. It appeared to be definitely submucosal, not firmly attached to the rectum and became somewhat effaced on deep palpation. It was approximately the size of a hen's egg and somewhat doughy in consistency. The patient complained of marked sensitivity with associated fullness on palpation of the larger mass. On complete extension of the finger into the rectum along the midline posteriorly a crater-like lesion was encountered with a prominent and freely movable corona of tissue about the size of a half dollar. Sigmoidoscopically, the distal rectal ampulla appeared to be approximately one-half normal diameter, and a bulging mass was noted posteriorly and to the right. At the 10 cm. level a necrotic ulcer, 3 cm. in diameter, with a raised peripheral border was firmly attached to the muscularis posteriorly.

Laboratory findings were as follows: The urine was essentially normal; serology was negative; hemoglobin was 14.7 gm. (92 per cent); the leukocyte count was 8,700; the differential white blood count was not significant.

An x-ray examination consisting of a barium enema with air contrast view was done two weeks before the patient entered the hospital and ruled out the possibility of a pathologic lesion situated higher in the large bowel. The mass that was freely palpable in the posterior and right anorectal quadrants was diagnosed tentatively by roentgen examination as a neurosarcoma of the right ischiorectal fossa.

Through a perirectal incision the smaller indurated nodule in the left posterior quadrant was removed. Biopsy was taken of the ulcerated area. A Silverman needle was inserted into the right ischioanal fossa and directed toward the large doughy mass in an attempt to secure tissue for examination but this attempt was unsuccessful.

Pathologic examination disclosed the firm, nodular bean-shaped specimen to be a leiomyoma and the crater-like ulcer to be a mucinous adenocarcinoma, grade III. A tentative diagnosis of the large boggy mass from which no biopsy could be secured was made of teratoma of the rectum.

The patient was prepared for a one-stage Miles abdominoperineal proctotectomy with permanent colostomy. The routine laboratory procedure included renal function tests and determinations of the blood protein levels. Daily bowel irrigations were instituted with enemas repeated until water returned clear. The patient was placed on a high protein, high vitamin, high caloric and non-residue diet. Sulfathaladine was given five days prior to surgery, and 2 gm. of streptomycin were administered on each of the two days before surgery.

The abdominal procedure followed the Miles technic of abdominoperineal resection of the large bowel. On reaching the sacrococcygeal area interference was not encountered while bluntly dissecting the mass free from this area.

From the perineal approach the anal outlet was closed with linen, using a purse-string suture. A racket-shaped cutaneous incision was extended from the perineal body to the tip of the coccyx. The levator ani muscles were identified and severed from their attachments to the rectum. The large mass, previously palpable, came readily into view on the right side, swinging from posterior to anterior. This mass was semifluctuant but smooth. It

was dissected free, with capsule intact, from the surrounding buttocks and the levator ani muscles. The rectum was carefully dissected free from the posterior rectovaginal septum and delivered complete with the mass which was attached to the rectum very loosely, and encapsulated independent of the rectum proper. This mass was approximately the size of a small grapefruit. The perineal wound was packed with two five-yard rolls of gauze over a rubber dam. No attempt was made to close this cavity to allow for free drainage and prevent the formation of an hour-glass closure.

Pathologically, the specimen consisted of the anus, rectum and sigmoid. At the 11 cm. level was an ulcerated area 3 cm. in diameter, with a rolled, hypertrophied, raised peripheral border. In the mesentery adjacent to the ulcerated lesion there were eight small, apparently normal lymph nodes, the largest measuring 8 mm. in greatest dimension. Grossly the ulcerated area did not extend through the entire wall of the bowel. Just posterior to the anus, but without demonstrable connection to it, there was a cyst 9 to 10 cm. in diameter filled with 300 to 400 cc. of dark, greenish brown, semiliquid material containing flecks of yellowish brown material. The cyst wall was a greyish thin membrane with a fatty surface.

The gross specimen revealed the dermoid cyst to have its beginning approximately 1.5 cm. cephalad from the mucocutaneous junction and to be directed to the right anteriorly, extending almost to the distal portion of the adenocarcinomatous lesion in the rectum. (Fig. 2.)

Microscopically, the sigmoidal mucosa was seen to be partially replaced by hyperchromatic pleomorphic cells. There was also some lymphocytic infiltration into the mucosa and submucosa as well as into the muscularis layer. In the submucosa many hyperchromatic pleomorphic cells with a fair number of mitotic figures were noted. These cells were grouped together and had a tendency to form gland-like structures. There was apparent mucinous degeneration of much of the submucosal tissue. Many cells had the appearance of signet ring cells. In the submucosa also, especially in the perivascular areas, rather marked lymphocytic infiltration was evident. Section of lymph nodes revealed some reticular hyperplasia without evidence of malignant tumor.

COMMENT

Frank, in 1931, referred to the most common site of these tumors as between the rectum and the sacrum. However, these cysts have been found in various positions, chiefly in contact with the rectum along the presacral fascia and extending usually above the levator ani muscle. Ewing referred to the experience of Germain and Sanger in his discussion of dermoid cysts of the pelvic connective tissue; Sanger in his collection of eleven cases noted the tumors to be situated behind the rectum. They ranged in size from a hen's egg to a man's fist, or larger. According to Ewing the tumors usually are made up of multiple cysts with many well defined hair follicles. The contents of the cysts, in addition to being of a soft greasy nature, contain granular sebaceous material encased in a tough epithelium-lined cavity.

Histologically, derivatives of all germ layers are found with an overdevelopment of one or more layers usually of the ectodermal derivative. The clinical history of these tumors indicates a slow-growing nature and an essentially benign course, so that symptoms are produced only by direct pressure on adjacent organs, and the condition often is obscured by complaints directed toward other body cavities.

This case presents an unusually unique detailed study of coexisting, well defined rectal and extrarectal lesions occurring in the same patient. The necessity for abdominoperineal resection because of the adenocarcinoma of the rectum facilitated complete extirpation and study of the true dermoid cyst.

The patient made an uneventful recovery and left the hospital fourteen days following surgery. Observation which continued over a period of eight months revealed the perineal wound to have closed completely with soft scar tissue. The colostomy functioned satisfactorily and the patient was irrigating through the permanent artificial anus every second day successfully, without secondary spillage.

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FOREIGN BODY IN THE RECTUM*

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B. S., a white male age fifty, was admitted to the Maimonides Hospital on December 4, 1947. He stated that about four hours prior to admission he stepped from his bath, went to stool, was frightened while playing with his dog, causing him to fall from the toilet seat onto a glass of the type used for old fashioned cocktails which was on the floor nearby. The glass entered the rectum.

The patient was a well nourished individual in excellent physical condition but in obvious distress. Blood pressure, pulse and respirations were within normal limits. The bladder was emptied of 1,000 cc. of clear urine which upon microscopic examination was not unusual. Prior to his admission the patient had taken a large dose of castor oil and now complained of severe abdominal cramps, tenderness in the lower abdomen and moderate distention.

Under spinal anesthesia of 150 mg. of procaine the examining surgeon was able to palpate the rim of the glass, but repeated attempts to remove it were unsuccessful, several pieces being broken, resulting in lacerations of the rectal mucosa. Packing was inserted to check hemorrhage.

On the following day because of severe abdominal pain and marked abdominal distention, a colostomy was performed through a left lower rectus muscle splitting incision, using a spinal anesthetic of 150 mg. of procaine. The glass could be palpated through the abdomen but could not be moved. A Penrose drain was passed through the mesentery and the sigmoid colon opened. A tube was inserted and fixed with a purse-string suture. Closure of the abdominal wall was done in the usual manner. The operation occupied one-half hour. Prior to operation the patient was given 50,000 units of penicillin every three hours and streptomycin (2 gm. daily) in eight divided doses. This medication was continued.

During the next week two unsuccessful attempts were made on the ward to remove the glass by rectal manipulation. Meanwhile the edema of the mucosa increased about the rim of the glass and the area became very tender. Seven days after admission the patient was again operated upon under a spinal anesthetic being given 150 mg. of procaine. A lubricated vaginal speculum was inserted in the anal canal, the glass exposed and a steel plunger placed in the center of the glass, which was then filled with a quick-setting plaster of paris and allowed to harden. When traction was applied to this, the plaster of paris mold came out but the glass did not move.

At this point a proctologic consultation was obtained. A proctoscope was inserted into the rectum and thus into the glass and the area inspected. There were some minor lacerations and a large edematous ring of mucosa, quite hemorrhagic, into which the remaining rim was embedded. The proctoscope was slowly withdrawn and the edematous ring flattened with the edge of the scope. A snub-nosed Yeomans biopsy punch was carefully inserted between the rim of the glass and the edematous, somewhat flattened mucosal ring, then placed under the thick rim of the glass. By gentle leverage along the rim of the glass the vacuum was broken. The glass became movable but further manipulation and rotation was necessary to avoid any further laceration from the jagged broken edges. In order to avoid injury to the operator a Crile retractor was shaped and placed in position between the glass and the rectal wall and the gloved hand inserted behind the retractor. It was then possible to grasp the base of the glass between the fingers. The glass was rotated and carefully extracted. A combination gauze pack was inserted against the previously infected lacerations.

The glass measured 8 cm. in length, 4 cm. in diameter at the bottom and 7 cm. in diameter at the open end. Two days later the rectum was again inspected and the ring of edematous mucosa found to be considerably reduced. The patient was referred to his surgeon and the colostomy later closed.

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AN EVALUATION OF OXYGEN THERAPY AS AN ADJUNCT IN THE POSTOPERATIVE MANAGEMENT OF CARCINOMA OF THE RECTUM AND SIGMOID COLON

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IT is the purpose of this investigation to determine whether or not anoxia of a sufficient magnitude occurs following resections for carcinoma of the rectum and sigmoid colon to merit some form of oxygen therapy, and to determine the most efficient mode for administration of oxygen by inhalation. Coincidentally, several other factors of interest in regard to optimum arterial oxygenation were noted during this study.

For the purpose of clarification in analyzing the need for oxygen therapy, anoxia is best subdivided into four types: (1) Anoxic anoxia may occur when the oxygen saturation of arterial blood is reduced and the arterial oxygen tension is concomitantly diminished. This type of anoxia may be produced by low oxygen tensions as occur at high altitudes, pulmonary abnormalities such as occur in pneumonia, asthma, emphysema, pulmonary edema and atelectasis, and congenital cardiac abnormalities where a shunt exists between the right and left heart. (2) Anemic anoxia is due to the lack of or inactivation of hemoglobin decreasing its ability to take up oxygen. (3) Stagnant anoxia is due to the retardation of circulation and the transportation of oxygen to the tissues. (4) Histotoxic anoxia is due to the drugging of the tissue cells so that they cannot utilize the available oxygen.

Anoxia which results in serious complications is usually a combination of all or several of the aforementioned types. Haldane[7] has emphasized the deleterious effects of anoxia. Lunsgarrd and Van Slyke[8] have shown that it is possible for subclinical anoxia to exist without cyanosis, and they point out that this state is apt to become injurious if sufficiently prolonged. When a state of acute anoxia with depression of the arterial oxygen saturation below 15 per cent of normal is prolonged, deleterious side effects may be expected in the postoperative patient.

Shortly after the discovery of oxygen and particularly after the demonstration by Lavoisier of oxidation as a life process, oxygen came into use as a therapeutic agent. It has been given by inhalation, by subcutaneous, intraperitoneal and intravenous injection and as hyperoxygenated blood transfusions. Oxygen has also been administered by rectal insufflation and by skin effusion. Ozone has been extensively used by inhalation and hydrogen peroxide has been given intravenously. Mixtures with other gases and at varying atmospheric pressures have been used. To date the inhalation route has proven to be the most efficacious method of administering this gas therapeutically.

During the past decade the administration of high concentrations of oxygen as a supportive measure to prevent peripheral vascular collapse in the immediate postoperative period and as an adjunct in the treatment of shock, *per se*, has gained fairly widespread acceptance. Yet in reviewing the literature there appears to be no agreement among clinical investigators concerning the harmful effects of oxygen in man or as to the most efficient mode to administer oxygen by inhalation, and some authors[11] believe that oxygen therapy is greatly overemphasized.

Boothby, Mayo and Lovelace[2] have advocated the use of 100 per cent oxygen as a prophylactic measure against shock in the immediate postoperative period but stress the fact that oxygen therapy should not be instituted exclusively when shock has developed. The authors point out that the oxygen saturation of arterial blood can be increased from 10 to 15 per cent by the administration of 100 per cent oxygen; and although this increased oxygenation is apparently small, it is important in states of diminished blood pressure since it does produce increased partial pressure of oxygen in the capillaries.

The blood as it passes through the capillaries gives up only about 40 per cent of its load of oxygen to the tissues under normal circulatory conditions. The venous blood, therefore, is still 60 per cent saturated and the partial pressure

of oxygen in the capillaries is equivalent to approximately 35 mm. of mercury. If for any reason the rate of circulation is decreased, as occurs for example in states of shock, the blood may liberate as much as or more than 80 per cent of its load of oxygen to the tissues. The capillary partial pressure of oxygen will fall from a normal of about 35 mm. to 14 mm. of mercury. In this case the inspiration of 100 per cent oxygen on the basis of the characteristic dissociation of oxyhemoglobin could be expected to increase the amount of oxygen available to tissues as much as 50 per cent.

Blalock[1] and his associates have experimentally confirmed the prevailing impression that the inhalation of high concentrations of oxygen exerts beneficial effects in the treatment of peripheral circulatory failure. They showed that a considerable increase in oxygen was available to the tissues as evidenced by a rise in arterial oxygen saturations throughout the body. The authors further concluded that oxygen availability was further enhanced by a concomitant increase in carbon dioxide tension.

Several investigators have reported the occurrence of irritation, congestion and even edema of the lungs in animals breathing high concentrations of oxygen for prolonged periods of time. Comroe[3] and associates noted substernal distress in their studies in 82 per cent of the normal males receiving 100 per cent oxygen for twenty-four-hour periods; they also noted that signs of nose and throat irritations were common. They concluded that the objectionable symptoms were due to tracheobronchitis. They suggested that if oxygen therapy must be continued beyond a 12-hour period the concentration should be decreased to 50 to 60 per cent, unless that concentration was insufficient to oxygenate the arterial blood since arterial oxygen unsaturation represents more of a threat to the patient's life than does the possibility of a tracheobronchitis.

On the other hand, investigators such as Boothby[2] and Evans,[5] respectively, report series of over 800 clinical patients who received 100 per cent oxygen for forty-eight-hour periods with no untoward effects. One hundred per cent oxygen has been used postoperatively for twelve to sixteen hours in over 500 patients on the proctologic service at Temple University Hospital. We have noted no undesirable effects and can only recommend its use most highly as an adjunct for the prophylaxis and treatment of shock along with blood and fluid replacement therapy in the immediate postoperative period following resections of the rectum and colon. Blood pressure and pulse are stabilized more rapidly with the prophylactic use of high concentrations of oxygen than without.

Our incidence of postoperative atelectasis has been small since we have been administering 100 per cent oxygen via the BLB mask. We also believe that our incidence of postoperative ileus has been reduced. However, it is impossible to state definitely whether the administration of 100 per cent oxygen along with the use of gastric suction in the immediate postoperative period has been the essential contributing factor or not. Fine[6] and his co-workers have shown that the administration of high concentrations of oxygen accelerates the decompression of bowel obstructions along with the intestinal intubation by facilitating the more rapid removal of nitrogen from the obstructed bowel.

Clinically, oxygen can be made available to the postoperative patient by several modes of administration. For practical purposes the oxygen tent, the intranasal catheter and the various types of masks, particularly the BLB and the OEM masks, are currently the most popular.

Several investigators have pointed out the gross inefficiency of the oxygen tent and its excessive cost to the patient over other methods. Webber[13] showed that a flow of 15 L. of oxygen per minute for thirty minutes was necessary to raise the concentration in the tent to 50 per cent. Thereafter it was necessary to maintain a constant flow of 10 to 11 L. per minute in a tight tent to hold the oxygen concentration in the vicinity of 50 per cent.

The high cost of oxygen has probably acted as a deterrent to its general use. Boothby[2] has estimated that to administer oxygen by tent costs the patient $12.00 to $25.00 per day, while oxygen by mask costs on an average of $5.00 to $8.00 per day and is capable of producing much higher blood saturations.

Cullen[4] and his associates favor the use of oxygen therapeutically via the intranasal catheter and state that arterial oxygen saturations of 89.5 to 99 per cent could be obtained by administering 7 L. of oxygen per minute by this route in normal healthy subjects.

Since there is still considerable disagreement among various authorities as to the best method to administer high concentrations of oxygen

most efficiently and with the least discomfort to the patient, the arterial oxygen saturations were studied pre- and postoperatively in a group of twenty-eight patients. These patients were submitted to resection for malignant lesions of the rectum and sigmoid colon and were studied with the view of evaluating their arterial oxygen saturations under practical rather than ideal conditions.

TABLE I
INTRANASAL OXYGEN

Case	Age	Control (Preoperative)			Fourteen to Sixteen Hours Postoperatively		
		Oxygen Content*	Oxygen Capacity*	Per cent Saturation	Oxygen Content*	Oxygen Capacity*	Per cent Saturation
F. J.	67	16.35	21.77	75.10	16.57	21.18	78.20
L. H.	52	15.01	19.21	78.20	17.13	21.03	81.45
J. S.	66	18.33	22.07	83.05	17.36	22.97	75.60
M. G.	57	14.12	19.26	73.30	16.30	20.16	80.80
P. B.	61	17.12	21.63	79.10	15.89	20.35	78.10
W. C.	37	16.26	20.22	80.40	18.13	22.35	81.10
I. G.	63	15.58	19.28	80.80	16.41	19.42	84.50
E. K.	60	15.65	21.51	72.70	18.05	20.92	86.30

* Volumes per cent.

Anemias were corrected preoperatively so that hemoglobin levels exceeded 13 gm. in all patients studied in this series. Blood losses were replaced during or immediately following surgery so that the postoperative hemoglobin levels, which were checked at the time that the postoperative oxygen saturation studies were made, did not fall below 13 gm. Red blood cell counts exceeded 4,000,000 per cu. ml. pre- and postoperatively in all patients studied. Preoperative blood chemistry determinations were within normal limits in all of the twenty-eight patients.

The nasal type of BLB mask was used for comparison for several reasons; primarily because it has been our observation that patients generally object to this type of mask less than they do to a full face mask. Many patients even with sedation in their immediate postoperative period became apprehensive and complained of the sensation of suffocation when full face masks were used. It is conceded that the nasal type of mask is probably somewhat less efficient than either a full face BLB or OEM mask, so it was deemed advisable to investigate its efficiency. Full face masks are recommended for mouth breathers.

PROBLEM I. A group of sixteen patients (Tables I and II) was first evaluated. The preoperative studies were made on samples of blood drawn from the femoral arteries of the patients upon their arrival in the operating room and just before the administration of the spinal anesthetic. All patients (Tables I and II) received from 90 to 120 mg. of sodium phenobarbital and 10 to 15 mg. of morphine sulfate preoperatively, as indicated by their respective ages and weights. Similar dosages of morphine were given every three to four hours during the immediate postoperative period. Blood samples were taken again from the femoral arteries of the same patients postoperatively following fourteen to sixteen hours of oxygen therapy.

TABLE II
OXYGEN VIA BLB MASK

Case	Age	Control (Preoperative)			Fourteen to Sixteen Hours Postoperatively		
		Oxygen Content*	Oxygen Capacity*	Per cent Saturation	Oxygen Content*	Oxygen Capacity*	Per cent Saturation
S. M.	52	17.49	19.93	87.70	19.56	19.23	100
E. P.	63	17.65	21.33	82.70	17.95	18.18	98.70
M. D.	53	15.22	20.66	73.70	19.23	20.56	93.50
E. O.	53	13.74	16.09	85.40	15.29	16.71	91.50
A. L.	53	17.44	22.67	77.00	19.37	19.61	98.80
A. K.	46	13.54	16.27	80.30	16.36	16.70	97.90
J. A.	60	14.42	16.70	83.40	16.95	16.88	100
S. C.	63	15.49	17.66	87.70	19.35	19.89	97.30

* Volumes per cent.

These patients were divided into two groups of eight each. One group received oxygen by intranasal catheter and the other group via the nasal type of BLB mask at a constant rate of 7 L. per minute. In the group receiving oxygen by catheter the catheters were replaced every four hours to rule out stoppage. The BLB masks were removed only momentarily during the fourteen- to sixteen-hour periods to permit wiping of the patient's face. All patients had Levin tubes emerging from beneath their masks which gave a possible point of oxygen leakage.

Method. The oxygen content and capacity of the arterial blood samples were determined by the Van Slyke and Neill manometric method. All samples were subjected to dual tests to check the accuracy of the determination.*

* Oxygen saturation measurements were made in the Department of Physiology, Temple University Medical School, by E. M. Greisheimer, PH.D., M.D. and D. Ellis, B.A.

Comment. A significant effect of preoperative medication is noted in the reduced oxygen saturations reported in the control series. (Tables I and II.) Arterial oxygen saturations were determined in a number of these patients the day before surgery when the patients were not subjected to the effects of barbiturates and opiates. Their arterial oxygen levels at that time ranged within normal levels of 92 to 95 volumes per cent saturation. This would indicate that a considerable degree of oxygen unsaturation might also exist in the immediate postoperative period when morphine analgesia is used and when increased or at least normal arterial saturations are desired.

TABLE III*

Case	Age	Control (Before Premedication)				Premedicated and One Hour after Spinal			Fourteen to Sixteen Hours Postoperatively (No Oxygen Therapy)		
		Oxygen Content	Oxygen Capacity	Per cent Saturation		Oxygen Content	Oxygen Capacity	Per cent Saturation	Oxygen Content	Oxygen Capacity	Per cent Saturation
R. B.	50	17.33	18.16	95.40	Brachial	16.95	18.61	91.10	17.81	19.34	92.10
					Femoral	16.58	18.44	89.90			
R. D.	55	12.02	12.81	93.80	Brachial	13.37	14.63	91.40	16.71	19.12	87.40
					Femoral	13.54	14.66	92.40			
F. G.	57	14.21	15.57	91.30	Brachial	14.38	15.52	92.60	14.20	15.98	88.90
					Femoral	14.13	15.34	92.10			
M. D.	58	19.68	21.74	89.70	Brachial	19.62	20.98	93.50	16.48	18.92	87.10
					Femoral	20.39	22.20	92.30			

* All blood samples were taken from the brachial artery unless otherwise specified.

McClure[9] and his associates have shown that barbiturates and morphine may decrease arterial oxygen saturations as much as 25 per cent in dogs and as much as 10 per cent or more in humans, chiefly through their histotoxic effect. The possibility of some degree of anemic anoxia must also be borne in mind in the immediate postoperative period in spite of well calculated attempts to replace blood loss. Undoubtedly all four types of anoxia contribute, to some extent, to the decreased arterial oxygen saturations found in these patients postoperatively.

From a comparison of the oxygen saturations obtained in these two groups of patients it is obvious that greater oxygenation of arterial blood can be obtained in the immediate postoperative period by the use of the BLB mask than by administering oxygen via the nasal catheter when oxygen is given at a constant rate of flow.

These patients were rather heavily sedated during the immediate postoperative period and no particular complaints were registered to either method of administering oxygen. Prior to this date oxygen has been administered to over 500 patients on the proctologic service postoperatively with the BLB mask and no appreciable discomfort has been noted as recorded with normal subjects in experimental trials.

PROBLEM II. Three additional groups of patients were studied in an attempt to present a more complete series of preoperative controls and to evaluate the effect of other opiates and spinal anesthesia on arterial oxygen saturations. Dilaudid hydrochloride was substituted pre- and postoperatively for morphine sulfate in the following groups of patients. Oxygen saturations were measured on brachial and femoral arterial blood samples sixty to 90 minutes after spinal anesthesia in four patients in Table III, and no oxygen therapy was administered in the postoperative period in this group of patients.

Comment. Several authors, particularly Seevers and Waters,[12] have pointed out that there is considerable diminution of the oxygen content of both arterial and venous blood during spinal anesthesia. Novack[10] noted no significant change in the oxygen saturation of arterial blood from cats during spinal anesthesia. McClure[9] and his associates stated that

there is little anoxia from the spinal anesthetic, *per se*, if vasodilatation and fall in blood pressure are controlled.

Little variation is noted in the arterial oxygen saturations before and after spinal anesthesia in the four patients studied in Table III. brachial and femoral arterial blood samples during spinal anesthesia.

Finally, two groups of four patients (Tables IV and V) who received dilaudid and sodium phenobarbital in their preoperative periods and dilaudid (2 to 3 mg.) every three to four hours

TABLE IV

Case	Age	Control (before Premedication)			Premedicated before Spinal			Fourteen to Sixteen Hours Postoperatively (Intranasal Oxygen)		
		Oxygen Content	Oxygen Capacity	Per cent Saturation	Oxygen Content	Oxyge Capacity	Per cent Saturation	Oxygen Content	Oxygen Capacity	Per cent Saturation
S. C.	63	17.07	17.94	95.20	15.72	17.00	92.47	14.79	16.73	88.40
C. F.	68	17.05	18.86	90.40	16.97	19.66	86.30	17.48	19.92	87.70
W. I.	49	17.67	19.29	91.60	18.00	19.77	91.05	20.07	22.29	90.04
J. K.	66	16.49	18.04	91.40	16.21	18.41	88.00	18.56	19.76	93.90

TABLE V

Case	Age	Control (before Premedication)			Premedicated before Spinal			Fourteen to Sixteen Hours Postoperatively (Oxygen via Mask)		
		Oxygen Content	Oxygen Capacity	Per cent Saturation	Oxygen Content	Oxygen Capacity	Per cent Saturation	Oxygen Content	Oxygen Capacity	Per cent Saturation
S. O.	45	18.56	19.71	94.20	16.57	17.69	88.00	18.21	18.08	100
W. L.	59	18.51	20.50	90.30	17.11	19.85	86.20	19.75	20.44	96.60
L. L.	55	16.70	18.18	91.90	15.49	17.66	87.70	19.38	19.89	97.30
F. F.	32	15.85	17.00	93.20	17.50	18.89	92.70	19.35	19.92	97.20

Any depression of arterial oxygenation was probably due to the effect of the sedation rather than the spinal anesthetic. The blood samples were taken sixty to ninety minutes after the administration of the spinal anesthetic (pontocaine hydrochloride 10 mg.) and prior to surgery.

This group of patients received no oxygen therapy in the postoperative period. They presented some degree of anoxia, however not nearly as great as those patients who received morphine analgesia in Table I. The first patient received only one dose (2 mg.) of dilaudid four hours postoperatively. There was no significant variation between the oxygen saturations of postoperatively were given 100 per cent oxygen by intranasal catheter and the nasal type of BLB mask in their postoperative periods. Oxygen saturations are compared in Tables IV and V. Less anoxia is noted with the use of dilaudid than with morphine in the pre- and postoperative periods. Here again higher arterial oxygen saturations can be obtained more consistently by administering 100 per cent oxygen via the nasal type of BLB mask than by the intranasal catheter at the same rate of flow.

CONCLUSIONS

1. Rather marked degrees of anoxia occur pre- and postoperatively when morphine is used

for sedation and analgesia. Here some form of oxygen therapy is indicated in the immediate postoperative period following resections for carcinoma of the rectum and sigmoid colon.

2. Dilaudid hydrochloride produces less anoxia than occurs with the use of morphine sulfate.

3. No significant anoxic effects were noted with spinal anesthesia when blood pressure was stabilized. Little variation was noted in the oxygen saturations of blood samples from the brachial and femoral arteries during spinal anesthesia.

4. One hundred per cent oxygen can be more efficiently administered via the BLB mask than by the nasal catheter method.

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DISCUSSION

Clifford E. Hardwick (Portland, Ore.): One significant finding described in Dr. Sherman's paper is a reduction in the arterial oxyhemoglobin saturation following administration of conventional doses of morphine and barbiturate preoperatively. This observation alone, however, does not prove that there is a reduction of tissue oxygen tension since such medication would also reduce the tissue oxygen requirement and consequently reduce the arteriovenous oxyhemoglobin difference. The fact that in this country thousands of patients are subjected to this preoperative medication daily without apparent mishap would suggest that the medication can be given without danger.

So far as the analysis of the two groups, oxygen therapy by nasal catheter and oxygen therapy by BLB mask, is concerned there is a significant elevation in the oxyhemoglobin desaturation when oxygen is given by the BLB mask. This fact is well known from previous studies. Whether the BLB mask should be used routinely is open to considerable question since it is likely that the lack of discomfort noted in the patients in the BLB mask group in this paper is due to the sedation given, such sedation resulting in reduction of oxygen saturation. The danger of untoward pulmonary complications following sudden vomiting with the mask in place would indicate caution in its routine use. The author states that the routine use of the BLB mask results in reduction of the incidence of postoperative atelectasis and ileus, but these most important points are not documented. It would seem that any decision as to the routine use of the mask would depend upon such figures rather than the mere demonstration of a variable reduction in arterial oxyhemoglobin.

The work of Price can certainly be questioned since his assumption that oxygen therapy is valueless in shock is predicted largely on the fact that there is no alteration of the rate of oxygen uptake in shocked animals breathing 100 per cent oxygen. This observation does not prove that an increase of tissue oxygen tension is not produced. It is well known that individuals breathing air at high altitudes show no reduction of oxygen uptake and that only in the severe chronic anoxic states associated with congenital heart disease is there a significant reduction in the rate of oxygen uptake. The conclusion of McClure that the reduction of arterial oxygen saturation by preoperative medication is due to histotoxic anoxia is erroneous since in histotoxic anoxia there is no reduction of the oxygen content of the blood, the block to oxygen uptake occurring in the tissues.

A final criticism here is concerned with the reason for the analysis of brachial and femoral arterial blood samples. It is difficult to tell from the author's work whether or not he expected a difference in the brachial and femoral arterial blood samples. With the sole exception of rare types of congenital heart disease it is impossible to postulate a difference in the gas contents of blood in any part of the arterial tree of the living subject under any conditions.

INFLUENCE OF LATERAL SPREAD OF CANCER OF THE RECTUM ON RADICABILITY OF OPERATION AND PROGNOSIS *

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Philadelphia, Pennsylvania

THE purpose of this presentation is to call attention to the importance of the lateral spread of cancer of the rectum becuase, in our opinion, this problem has not been given adequate consideration. In this study a series of patients were injected with a dye to determine the lymphatic distribution of the lower portion of the rectum. The results of these investigations are deemed of sufficient interest to warrant this report.

TABLE I
PERCENTAGE OF FIVE-YEAR CURE

	Resection	Excision
Hochenegg[13]	37.0	31.0
Eischoff[7]	42.0	36.0
Finsterer[9]	33.3	22.5
Finsterer[10]	40.4	30.0
Schoenbauer and Pfab[27]	30.0	22.0
D'Allaines, LeRoy and Dubost[3]	70.0	40.0
Dixon[4]	67.7	44.8

Table I shows the percentage of cancer patients on whom various surgeons have used different operations. Resection or selective extirpation is used when the tumor is located in the upper portion of the rectum and is associated with restoration of bowel continuity. Excision, also called amputation because the entire end of the intestine is excised, is employed when the lesion is located close to the anal outlet. The figures in this table emphasize the fact that a better prognosis is achieved in high lesions, even when more economical procedures are employed, and indicate that the location does present a bearing on the prognosis of the patient.

Gilchrist and David[12] found a 51.8 per cent five-year cure rate when the cancer was located below the peritoneal reflexion and a 65.4 per cent rate when above the peritoneal reflexion. Decisive evidence of the importance of the level of the lesion was presented also by Waugh and Kirklin[32] and by Sunderland.[28] (Tables II and III.)

TABLE II
ADENOCARCINOMA GRADE II, TREATED WITH COMBINED ABDOMINOPERINEAL EXCISION
(Waugh and Kirklin)

Level above Anal Margin	Per cent of Traced Patients with Nodal Involvement Five or More Years after Operation
0 to 2 cm	27.8
3 to 6 cm	23.8
7 to 10 cm	31.0
11 or more cm	43.5

TABLE III
SURVIVAL ACCORDING TO ANATOMIC SITE
(Sunderland)

Distance above Anal Margin	Total	Living and Well Five Years	
		Number	Per cent
6 cm. or less	47	22	46.8
6 cm. to 12 cm	36	29	80.6
13 cm. or more cm	17	13	76.5

We call attention to the striking difference in the end result for lesions located above and below the 6-cm. level as measured from the anal margin. The cause of this difference is the main subject of this paper.

Among the three modes of metastatic spread venous invasion is undoubtedly important in cancer of the rectum as emphasized by Lahey,[15] Seefeld and Bargen,[26] and others. Blood vessel invasion other than emboli is limited to the areas to be resected, as pointed

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out by Dukes,[5] wherefore no influence on radicality of the operation can be invoked. But is the addition of the inferior and middle vessels the explanation? Probably not, because in this case a higher percentage of lung metastasis would be reported. Sunderland[28] has cited a higher incidence of venous involvement when the tumor is located in the low rectum than in the high rectum. His results are illustrative.

TABLE IV
SURVIVAL ACCORDING TO ANATOMIC SITE
(Sunderland)

Distance above Anal Margin	Without Vein Invasion Living and Well Five Years			With Vein Invasion Living and Well Five Years		
	Total	Number	Per cent	Total	Number	Per cent
6 cm. or less	27	16	59.3	20	6	30.0
6 cm. to 12 cm.	28	23	82.1	8	6	75.0
13 or more cm.	16	13	81.3	1	0	0

Two important conclusions can be drawn from Table IV: (1) The prognosis without venous invasion still varies according to the height of the lesion. (2) There is a marked difference which persists in spite of venous invasion. If venous involvement did play the most important role, the prognosis would be almost similar. Furthermore, there is substantial evidence that the incidence of local recurrence is influenced by the location of the lesion, thereby affecting the prognosis. Gilchrist and David[12] reported a local recurrence rate of 3.6 per cent when the lesion was located above and 30 per cent when below the peritoneal reflexion. Additional data are available. (Table v.)

TABLE V
RELATIONSHIP BETWEEN LOCAL RECURRENCE AND LEVEL OF THE LESIONS

(Oppolzer and Nietsche)[20]	
1 to 5 cm.	63.0%
5 to 10 cm.	32.8%
10 to 15 cm.	31.6%
15 to 20 cm.	14.2%
(Wangensteen and Toon)[31]	
0 to 5 cm.	30.0%
6 to 8 cm.	25.0%
9 to 13 cm.	6.3%
14 to 20 cm.	0

In addition to venous invasion the modes of spread which must be considered are the direct and the lymphatic. Direct extension in low-lying lesions does not offer a poorer prognosis than in those cases in which the level lies above the peritoneum. The rectum is enclosed by perirectal fascia and fat tissue which serve as a barrier against invasion of other structures, while at a higher level most of the rectum is unprotected. Consequently, within the peritoneal cavity such organs as the bladder, uterus, ovary, small bowel and peritoneum are more vulnerable to invasion.

TABLE VI
DISTANCE OF MIDDLE HOUSTON VALVE FROM ANAL MARGIN

Waldeyer[30]	7 to 8 cm.
Esmarch[8]	6 to 8 cm.
Quénu-Hartmann[22]	6 to 7 cm.
Bacon-Sauer	6 to 9 cm.

Although neither venous involvement nor direct spread offers a supportive reason for the sharp contrast in prognosis, lymphatic metastatic spread is explanatory according to the level of the lesion. As we have observed, the most marked change centers around the 6-cm. level above the anal margin. This point coincides with the peritoneal reflexion and with the middle valve of Houston, also termed Kohlrausch's fold or plica. The distance of this valve, as measured by some authors, is shown in the Table VI. The significance of this landmark is of the utmost importance in our opinion. According to Villemin, Huard and Montagné,[29] and Oliveira[19] this is the point of limitation between the two lymphatic areas of the rectum. Figure 1, modified from Villemin and co-workers,[29] is highly illustrative.

A yellow dye was injected below the middle valve of Houston and a blue dye above that valve. Two different networks of lymphatics of the mucosa were visualized, with a sharp delineation between. The point of limitation proved to be the middle valve of Houston. The channels of the downward and lateral spread became colored in yellow while those of the upward spread were stained green. This is readily comprehensible since they represent the common pathways for the lymphatics of the low as well as the high rectum. Another important demonstration by the same authors was made by injecting the upper rectum above the fold. (Fig. 2.)

In this particular instance only the lymphatics running along the superior hemorrhoidal vessels were stained. Thus it is evident that the rectum possesses two different lymphatic areas of origin. This assertion was confirmed by

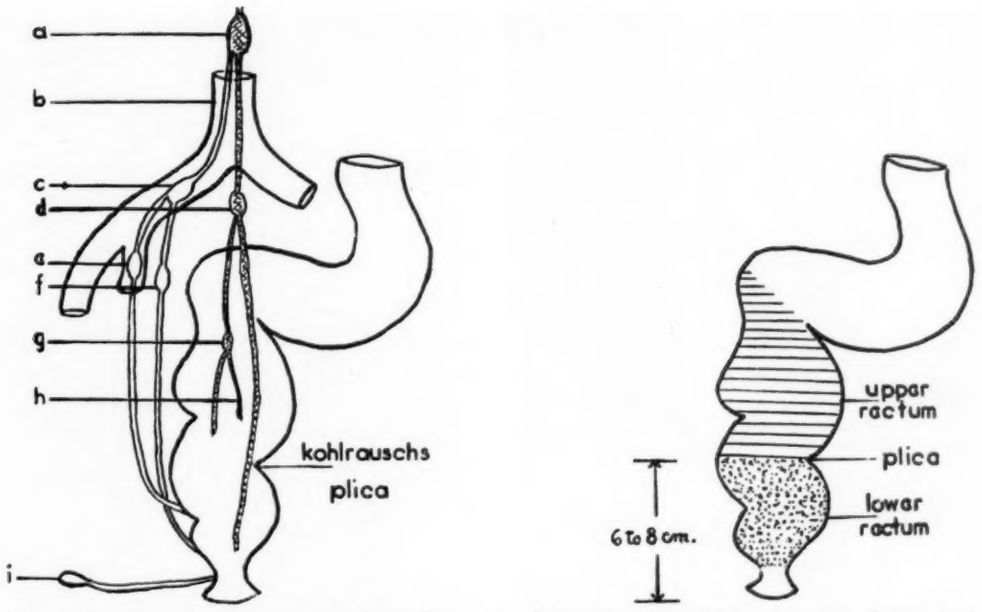


FIG. 1. A yellow dye was injected into the rectum below the plica and a blue one above. It is clearly shown that the rectum has two distinct lymphatic networks and that the plica is the limit between them. The inferior and lateral trunks drain only the lower rectum while the superior pedicle drains the upper and lower rectum. (*a*) aortic nodes; (*b*) rectosigmoidocolic nodes; (*c*) iliac nodes; (*d*) rectosigmoid nodes; (*e*) hypogastric nodes; (*f*) sacral nodes; (*g*) anorectal nodes; (*h*) anorectal nodes; (*i*) inguinal nodes. (Modified from VILLEMIN, HUARD and MONTAGNÉ, *Rev. de chir.*, 63: 39, 1925.)

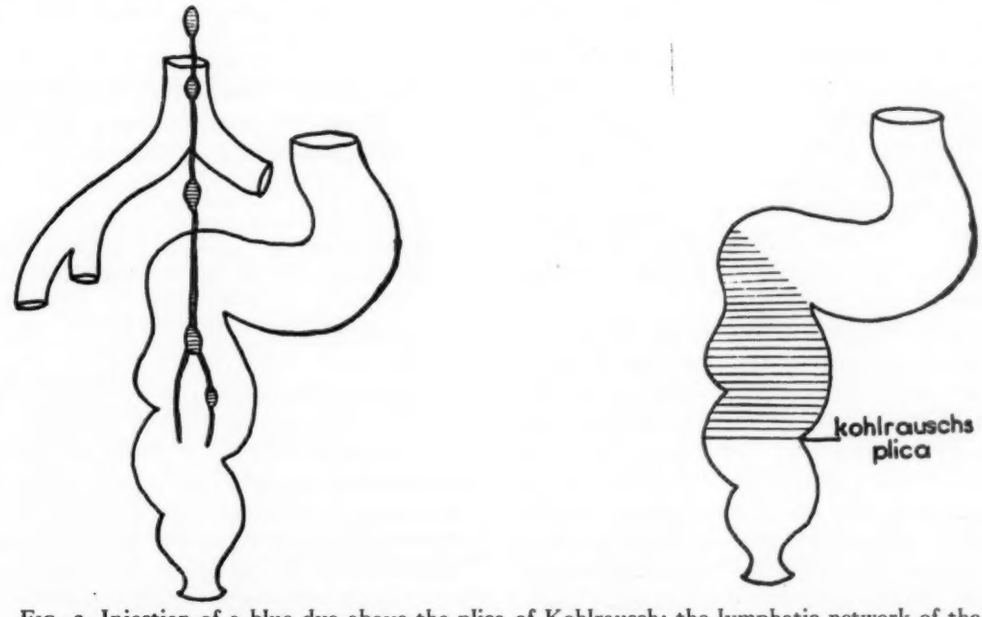


FIG. 2. Injection of a blue dye above the plica of Kohlrausch; the lymphatic network of the upper rectum is colored by the dye and the lymphatics accompanying the superior hemorrhoidal veins are the only ones to become colored by the dye. (Modified from VILLEMIN, HUARD and MONTAGNÉ. *Rev. de chir.*, 63: 39, 1925.)

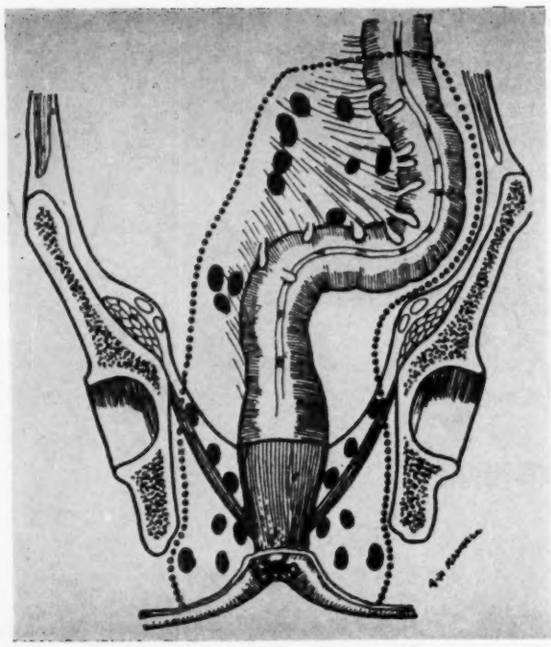


FIG. 3. Nodes which could be involved by metastasis from cancer of the rectum; on the lateral area the nodes are shown to be placed over the levator ani muscles. (Taken from MILES, W. E. Cancer of the Rectum. London, 1926. Harrison & Son.)

FIG. 4. The three main pedicles of the lateral area: (1) anterior, running along the prostate and the bladder to end at nodes of the external and internal iliacs; (2) lateral, along the middle hemorrhoidal vessels; (3) posterior, along the middle and lateral sacral vessels. All nodes are out of the reach of an ordinary abdominoperineal excision. (From POIRIER, CUNÉO and DELAMÈRE. The Lymphatics, Chicago, 1904. W. T. Keener & Co.)

Oliveira[19] in 1947. The division of the rectum into two separate zones has been known since 1895 when described by Gerota[11] and later by Poirier and coworkers.[21] This lymphatic pattern is irrefutable evidence that the simple spread of high lesions can be managed more effectively than the complicated territory of the whole lymphatic area of the rectum. The addition of the downward and lateral areas of spread can satisfactorily explain the difference between the prognosis of lesions situated at different levels.

To what extent does each of these two modes of spread participate in altering the results? There are some reports of metastasis to the inguinal nodes in cancer of the rectum even without involvement of the anus, but the incidence of this occurrence is not sufficiently high to explain the marked difference in the prognosis. Furthermore, there is evidence that lateral spread does occur and much more frequently than is generally recognized. Coller, Kay and McIntyre[1] have reported suggestive findings. (Table VII.)

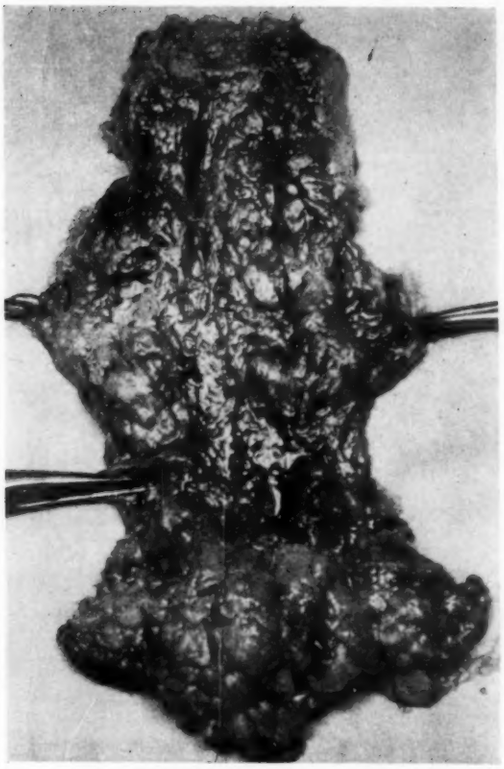
Here again the same limit was found and the authors have stated that no lateral spread occurred in lesions located more than 3 cm. from the pectinate line, which is approximately 6 cm. above the anal margin. Several surgeons,[25,34] particularly D'Allaines, are of the opinion that the lateral spread is of great significance in prognosis of cancer of the rectum. However, no decisive evidence has been presented. A suggestive case was the one cited by Wood and Wilkie[33] who injected

TABLE VII

PERCENTAGE OF INVOLVEMENT OF THE LATERAL AND SUPERIOR AREAS OF SPREAD ACCORDING TO THE LOCATION OF THE LESION IN CASES WITH NODAL INVOLVEMENT

(Coller, Kay and McIntyre)

Location	Lateral Area	Superior Area
Anus and last 3 cm. of rectum	54.5	100
High rectum	0	100
Rectosigmoid	0	100
Above rectosigmoid	0	100



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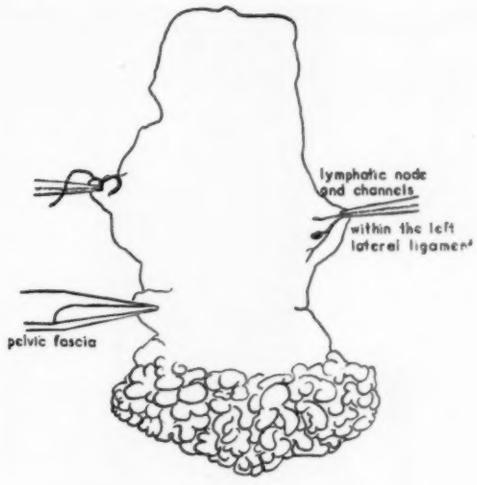

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FIG. 5. Distal portion of a specimen taken from a Miles excision; the scissors point to the levators ani and the hemostats to the lateral ligaments. The distance between these two structures is well marked. Lymphatic channels and a node colored by the Evans blue dye are shown in the left lateral ligament.

trypan blue in the lower part of the rectum of a moribund patient whereupon at autopsy the glands alongside the hypogastric vessels were found stained by the dye. The lack of more emphasis on the subject may be explained by an anatomic misinterpretation. The description by Miles[16] has been accepted almost universally without the necessary correction as already mentioned by Jenkins[14] and Norbury.[18] Norbury said, "Although all authorities are in agreement with the description given by Miles of the upward lymphatic spread of cancer, they do not see eye to eye with his lateral and downward zones of spread. If his contentions were infallible, operations as described by Hartmann or conservative resection in its various forms, would be unscientific and unjustifiable on pathological grounds." Dr. Norbury's statement is based on a survey at the St. Mark's Hospital during a ten-year period.

The description by Miles[16] that the zone of lateral spread embraces the structures, the lymphatics of which enter into relation with the lymphatic network between the levators ani and the pelvic fascia, is inaccurate and misleading. As we can observe in Figure 3 from Miles,[17] all pelvic nodes are shown to be located over the levators ani, which is not true. They are located on the pelvic walls and within the lateral ligaments, as represented in Figure 4 from Poirier, Cunéo and Delamère.[21] From an analysis of Figure 4 it becomes evident that the objective of the abdominoperineal procedure for resection of the pelvic nodes is not accomplished. Furthermore, the levators are not a site for metastasis to occur but rather are subject to direct spread, as demonstrated by Wood and Wilkie[33] and by Dukes.[6]

The area of lateral spread along the middle hemorrhoidal channels also did not receive the necessary attention. The lateral ligaments, which are the structures to carry this mode of spread, are not usually resected widely. They are ordinarily severed more with the purpose of liberation of the rectum than with the intention of radical extirpation. Our contention

6A

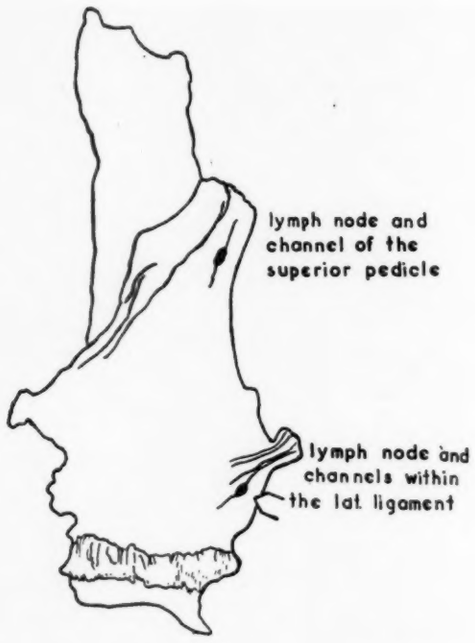

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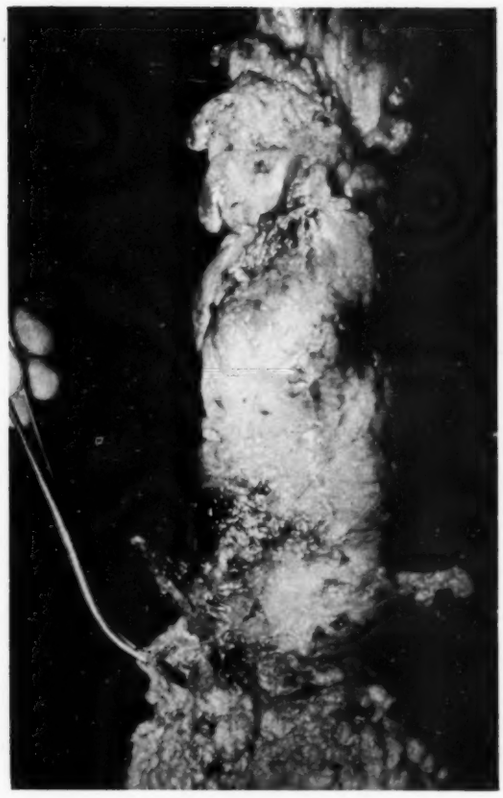
FIG. 6. Pull-through operation; both lateral ligaments are well demarcated. On the left, lymphatic channels as well as a node are clearly stained by the dye. Another node is seen in the upward area close to the point of ligation of the superior hemorrhoidal vessels.

is not new. In 1924 Reinhold[24] published a thesis in Paris stressing the importance of the removal of the entire pelvic fascia including all the lateral ligaments. Later Ricard[25] stressed the importance of the lateral ligaments and showed, as Reinhold[24] had done, an approach for its entire removal. More recently D'Allaines, LeRoy and Dubost[3] have emphasized this point particularly. During the operation in searching for metastasis the lateral ligaments were palpated and in many cases it was found that these structures were thickened by infiltration of the nodes. For the purpose of demonstrating the relationship of lateral pedicles with the levators and, further, to show that the lateral pedicle of the lateral area of spread does not run over the levators but within the lateral ligaments, we have injected a group of fifty patients with the Evans blue dye, also named T-1824, prior to operation. The technic consisted of injecting the dye into the mucosa. To reach only the mucosa is particularly difficult *in vivo*. A great portion of the dye passes to the submucosa and the neighboring tissues are infiltrated. However, the spread always follows a definite pattern and the lymphatic channels can be visualized and followed to the nodes. This injection has been made almost routinely in our cases and we observed the same lymphatic pattern described by Poirier and his co-workers[21] and also that the trunks of the middle hemorrhoidal pedicle run within the lateral ligaments and not over the levators. (Figs. 5 to 8.)

As a result of our conclusions we have dissected the pelvic nodes from the pelvis to determine in what percentage they are involved and for improvement of the prognosis of low-lying lesions. The operation we recommend has been performed in seventeen of our cases. In some the procedure was partial and in others it was used for high lesions for comparison. In two cases nodes containing metas-



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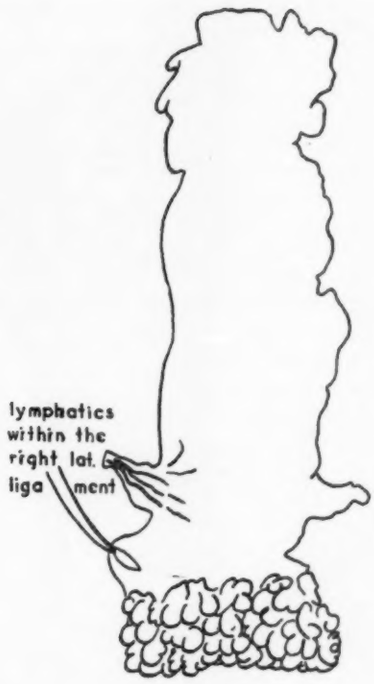

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FIG. 7. Miles' operation; the right lateral ligament shows the dye. A hemostat holds the pelvic fascia. The lower part of the fascia covers the levators while the upper portion was removed from the sacrum. As in other specimens, no dye is present in the fascia showing that the lateral pedicle of the lateral lymphatic area runs within the lateral ligaments together with the middle hemorrhoidal vessels.

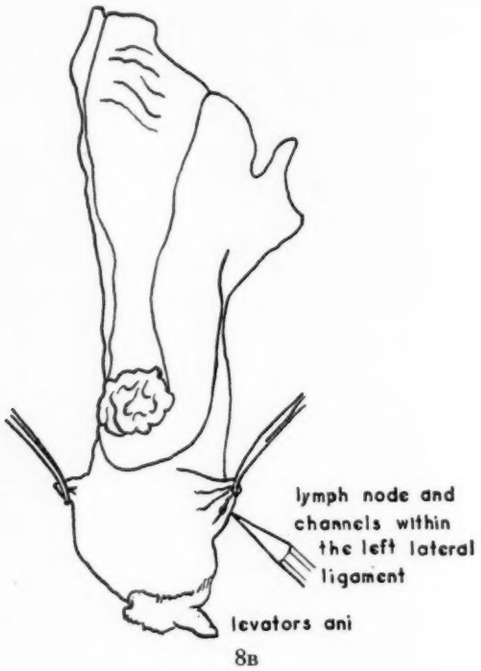
tasis were found and in both cases the cancer was located in the low rectum. Ordinarily these nodes would be left in the pelvis were only a classical Miles abdominoperineal procedure employed.

CONCLUSIONS

Many clinical and pathologic facts have suggested that the description made by Miles requires revision. Although his description is fairly accurate and has represented one of the most significant contributions to surgical treatment of cancer of the rectum, two points are of great importance and should be reevaluated. (1) The rectum is divided into two distinct lymphatic areas. One is located above Kohlrausch's plica (middle valve of Houston) and the other below. This anatomic finding is well substantiated by the difference in prognosis according to the location of the lesion in the rectum. (2) The lateral pedicles, as described by Miles, would seem to be located between the pelvic fascia and the levator muscles. For this reason overemphasis has been placed on resection of the levators while the lateral ligaments as well as the nodes along the iliac vessels are neglected.

In order to evaluate the importance of the lateral ligaments in relation to the lateral mode of spread a series of fifty patients were injected with a dye before operation, and we reached the conclusion that the middle hemorrhoidal pedicle should be considered as constant and that they present frequently the nodes described by Cunéo and Marcille.[2] If this study does not furnish decisive proof, it at least strongly suggests that (1) the lateral area of spread has been inadequately considered and certainly improperly managed surgically, and (2) all lesions below the middle valve of Houston should be removed by a combined abdominoperineal excision, complemented by wide extirpation of the lateral ligaments and dissection of the iliac nodes,

8A



8B

FIG. 8. Pull-through operation; the tumor protrudes through the anterior wall of the rectum, incompletely open, above the peritoneal reflexion. The lymphatic channels and a node were stained by the dye within the left lateral ligament. On the right side some channels were also stained. There is a considerable distance between the lateral ligaments and the levators.

both internal and external, as well as the sacral.

Among seventeen cases in which this procedure was performed two were with pelvic nodes containing metastasis. It is worthy of mention that there were no deaths and the morbidity was not increased.

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DISCUSSION

Donald R. Laird (Portland, Ore.): It is a pleasure to hear and discuss this extremely interesting work on the lateral spread of carcinoma of the rectum. Although comparative statistics may be misleading occasionally, the evidence as presented, which includes the observations of many men over a considerable period of time, seems to prove that patients who have carcinomas below the 6-cm. level have a poorer prognosis than patients having carcinomas above this level.

Drs. Sauer and Bacon have offered good arguments that neither venous involvement nor direct spread explains the poor prognosis of low rectal carcinomas. The illustrations were excellent.

The statistics on local recurrence below the peritoneal reflexion were particularly interesting to me. Gilchrist and David, Wangensteen and Toon all agree that the local recurrence rate is about 30 per cent when the lesion is located below the peritoneal reflexion. This brings to mind a point not mentioned by Dr. Sauer which might help to explain the high recurrence rate in extremely low-lying lesions. Lesions in the low rectum just above the levators are more difficult to remove. Since the dissection is done bluntly, blindly and usually from above, there is more danger in inadvertently dissecting into local extensions in the fat, in tearing a local extension or in opening the bowel thereby allowing clumps of cells to contaminate the area. It is in this stage of the dissection that more pressure or tension is put on the lesion, and it is conceivable that metastasis may occur into the lateral lymphatics and local fat during the operation. Dr. Sauer believes that the perirectal fat offers a barrier to local extension but it is just as reasonable to believe that the fat acts as a medium for both direct and lymphatic extension.

We all have a conviction or two. One of mine is that malignant lesions should be handled gently. I am sure that if one avoided direct handling or at least minimized trauma to the lesion itself and divided the blood and lymphatic supply before proceeding with the mobilization, divided the lateral ligaments of the rectum widely and removed the iliac and hypogastric glands in selected cases, the 30 per cent local recurrence figure could be cut down materially.

Dr. Sauer has demonstrated a sharp delineation of the lymphatic drainage at the 6-cm. level. I should like to call attention to a similar delineation at the dentate margin in which the lymphatics inferior to the dentate margin drain mainly to the inguinal glands. I have never seen inguinal gland

involvement without involvement of the dentate margin.

I am in agreement with Dr. Sauer's conclusions. In general, I believe this work points the way toward more radical dissections in low rectal lesions.

We are most certainly indebted to Drs. Sauer and Bacon for this excellent paper calling attention to the lateral mode of spread and demonstrating it by the use of dyes used preoperatively. We can all profit by following their lead. I would like to ask Dr. Sauer to elaborate just a little on the technic so that we may check our dissections.

JOHN G. MATT (Tulsa, Okla.) The paper by Drs. Sauer and Bacon is of timely importance because of the difference of competent opinion as to the operation of choice in handling carcinoma of the upper rectum and lower sigmoid.

It has seemed futile to me to compare statistical data of one group with material assembled by another as long as there are no strict analytic criteria by which all variables can be controlled identically by each group. The most difficult variable has been the location of the growth along the longitudinal axis of the bowel because many large lesions will overlap one or even two of such arbitrary points as 3 cm., 6 cm. or, particularly, the rectosigmoid, which latter point seems to move up and down like the ocean tide. Drs. Sauer and Bacon perhaps have solved this dilemma by pointing out to us that the middle rectal plica is the limiting point of lateral and downward spread of the lymphatics cephalad to it. Since this observation has been made repeatedly and because contrary evidence has not been brought forward, it seems to me that the pro-Miles argument collapses and the only difference of opinion remaining is the relatively unimportant one of whether the operation for a lesion above Kohlrausch's fold is to be of the pull-through or the anterior resection type depending on the personal preference of the individual surgeon.

The problem of what to do with lesions lying below this level must be solved on a different basis, however. Drs. Sauer and Bacon agree that abdominoperineal excision is the operation of choice here, but they have presented considerable evidence to prove that the classical Miles procedure is being inadequately performed. They have demonstrated that to be complete, abdominoperineal resection also must include complete removal of the lateral areas of spread. This means an orderly, meticulous block dissection of the lateral ligaments and the hypogastric, iliac and lumbar nodes.

The iliac and lumbar (aortic) nodes are relatively constant in number and location, there being usually eight hypogastrics, lying upon the medial aspect of the like-named artery or vein in the fatty retroperitoneal tissue; of the four to six common iliac glands, one or more may be hidden dorsal to the common iliac vessels. An equal number of nodes will be found in relation to the fifth lumbar vertebra below the bifurcation of the aorta. I seriously question it if the man who performs abdominoperineal resections in sixty-five to seventy-five minutes accomplishes removal of more than half of these important glands. I further doubt that the man who has enough tissue left to permit him to "close" the perineal wound has given the patient his best chance for cure.

Complete pelvic lymphadenectomy certainly will add to the hazard of an already formidable procedure; but when one considers that in cases of rectal carcinoma with node involvement the percentage of five-year survivals reported from centers doing the Miles operation averages only 30 per cent, one might be willing to risk a reasonably higher immediate mortality if this could be justified by a proportionately greater over-all salvage rate.

ILLYDIO SAUER (closing): I wish to express my sincere thanks for the discussions of Dr. Laird and Dr. Matt. Regarding the first question, lesions above the peritoneal reflection where all coats of the bowel are involved should be considered more prone toward distant metastasis because of peritoneal dissemination. Such, however, are more difficult to manage than those limited with local extension situated below the aforementioned landmark. Pertinent to the second inquiry, it should be stated that in some instances when the rectum was injected prior to operation the dye was not evident immediately upon opening the abdominal cavity. Yet shortly after the operative manipulation of the rectum for its liberation the dye made a rapid appearance. This not only shows the importance of muscular contractions and intestinal movements in the circulation of the lymph but also disseminates the cancer cells during manipulation.

The technic of the injection is simple. Two cubic centimeters of Evans blue dye (methylene blue or trypan blue may serve as well) are injected into the mucosa of the rectum approximately two hours before the operation. Care should be exercised not to inject the submucosa because the spread will be difficult to evaluate due to diffusion of the dye to other tissues. Small amounts are injected around the rectum and always at the same height. In this way the diffusion through the submucosa, should it occur, will be limited to small areas. When one becomes accustomed to the method and is able to recognize the lateral ligaments and levators, the infiltration of the tissue will not prove disturbing. To avoid diffusion of the dye it is essential that tissues are not torn during the dissection.

CARCINOMA OF THE ANUS, RECTUM AND SIGMOID

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THIS is a review of 300 consecutive private cases of carcinoma of the anus, rectum and sigmoid. Lesions removed by fulguration through the sigmoidoscope are not included in this series. Neither are cases diagnosed but not treated, nor are the cases from our charity service at the Kansas City General Hospital included.

The purpose of this review is to show the trend in the surgical management of anorectosigmoid carcinoma on our service and to bring the over-all picture into sharper focus by a critical survey.

The trend is best shown by a division of the 300 consecutive cases into three series of 100 cases each: Series A covers the period from May, 1942, to October, 1945; Series B covers the period from October, 1945, to January, 1948; Series C covers the period from January, 1948, to March, 1950.

The objective in the treatment of cancer is to eradicate the disease entirely with the least possible injury to the patient. If the disease cannot be eradicated, treatment should be employed which affords the greatest comfort for the longest period of time. Attempting to accomplish this result the procedures employed could be grouped under eleven headings. (Table 1.)

The revolutionary advances made in the pre- and postoperative care during the past decade especially have profoundly altered our concepts of colon surgery, as shown by the comparative figures of series A, B and C in classifications 1 to 5.

The present trend in surgical procedures employed is directed by a combination of factors including the use of the sulfa drugs, antibioties, Wangensteen negative pressure gastric drainage, Miller-Abbott tube, anticoagulants, refinements in anesthesia, early ambulation and the build up and maintenance of nutrition by the use of blood, plasma, protein hydrolysates, glucose and vitamins. As a result of these infection is now rare; many cases previously thought inoperable, with proper management, became operable. Age alone is no longer a barrier to surgery; anastomosis is mechanically and physiologically possible at almost any level; and operative mortality has approached close to the irreducible minimum. We must wait for time to tell the effect of our changing procedure on five-year cures.

The abdominoperineal resections have shown a steady decrease in the number of two-stage procedures during the period of this survey. Series A shows thirty-five one-stage and nine two-stage operations while series C shows thirty one-stage and only two two-stage procedures. The one-stage abdominoperineal resection series was the only one to develop postoperative obstruction or develop thrombophlebitis except a mild phlebitis in one Mikulicz resection.

In the 103 cases one death occurred from a transfusion reaction, four developed postoperative obstruction and six developed thrombophlebitis to some degree. Of these complications it is difficult to explain why three small bowel obstructions and three cases of thrombophlebitis should occur in the most recent or series C. Metastasis to regional lymph nodes was found in twenty-four cases and liver metastasis in nine cases. In a total of 242 cases in which the abdomen was explored, regional lymph node involvement was found in sixty-five cases or 27 per cent and liver involvement in forty-one cases or 17 per cent.

As confidence was gained in our ability to do an adequate resection and a safe anastomosis more primary low anastomosis and fewer Mikulicz and abdominoperineal resections were done. This is shown by the increasing number of anterior resections with primary anastomosis. In series A only one anastomosis was done without colostomy while three anastomoses were done with protective colostomy. In series B four anastomoses were done without while seventeen were done with a protective colostomy. These figures are about reversed in series C when twenty-two anastomoses were done without and only four done with a protective colostomy.

It is noteworthy that this group of fifty-one cases had no complications except one coronary

death and four wound disruptions, there being none in the older series A, only one in series B and three in series C. Most of the incisions are closed with steel wire, but of the three disruptions in series C all occurred in wounds closed with gut suture, one resulted from wound infection and two in fat men with persistent cough. The few disruptions recorded here have been an embarrassing incident to the surgeon rather than a serious threat to the patient, and without exception, recovery was amazingly uneventful.

The Mikulicz type of anterior resection of the sigmoid has been reduced from 15 per cent in series A to 7 per cent in series C. We still do not hesitate to use this procedure in the presence of infection, a distended bowel or other factors which might impair healing and increase operative risk. There were two deaths, one from pulmonary embolism ten days postoperatively and one from generalized carcinomatosis thirty-three days postoperatively. (Table II.)

The "pull through" type operation has been performed only seven times in this series.

Anterior resection with permanent colostomy and retention of the rectal stump is used for cases in which the tumor is removed as a palliative measure in the presence of extensive liver metastasis, local spread to the peritoneum or adjacent organs which make local recurrence certain and when removal of the anus and rectal stump adds risk and prolongs convalescance to no advantage.

Palliative colostomy in late carcinoma continues to be a necessary but futile gesture to prolong a hopeless situation. For the most part this operation continues to be a monument to ignorance and procrastination on the part of the patient and to poor diagnosis on the part of the doctor. Five such cases in series C as compared to eleven in series A is encouraging.

The highest mortality rate is credited to the palliative colostomy group with three deaths. One patient entered the hospital with obstruction and evident peritonitis and failed to respond to therapy following colostomy while two died of generalized carcinomatosis four and six

TABLE I

Type of Operation	Total Cases	Cases			Died			Postoperative Obstruction			Phlebitis Thrombosis			Disruption		
		Series			Series			Series			Series			Series		
		A.	B.	C.	A.	B.	C.	A.	B.	C.	A.	B.	C.	A.	B.	C.
1. Abdominoperineal One-stage	88	35	23	30	1			1		3	2	1	3			
2. Abdominoperineal Two-stage (103)	15	9	4	2												
3. Anterior resection Open anastomosis	26	1	4	22											1	3
4. Anterior resection Protective colostomy (51)	25	3	17	4			1									
5. Mikulicz resection	32	15	10	7	1	1					1					
6. Proctosigmoidectomy "pull through"	7	0	2	5												
7. Anterior resection Permanent colostomy	20	8	6	6												
8. Palliative colostomy	24	11	8	5	2		1									
9. Posterior resection	21	6	8	7												
10. Coagulation	37	12	15	10												
11. Colectomy for diffuse polyposis	5	0	3	2												
Totals	300	100	100	100												
12. Transcolonic polypectomy	13	0	2	11												

weeks, respectively, following colostomy. (Table II.) While there was a total of seven hospital deaths, three of the seven followed palliative procedures in the terminal phase of generalized carcinomatosis and should not be considered as operative deaths. There were no deaths from postoperative infection.

We continue to resort to posterior resections in a few cases in which a perineal colostomy is insisted upon and those unsuitable for other procedures.

Thirty-seven of the 300 patients or about 12 per cent were treated by coagulation. Two types of low rectal lesions were treated by this method.

The first included those who were unable to undergo surgery due to debility, those who refused surgery and those requiring only temporary palliation. The second include grade 1 papillary adenocarcinoma of the type in which one area shows adenoma and another shows low grade carcinoma. In such lesions the inexperienced pathologist may hesitate to make a definite diagnosis of carcinoma with its serious portent. With this type of lesion it is unfair to place the entire burden of decision upon the pathologist and either sacrifice the rectum needlessly because of a diagnosis of carcinoma or to fail to do an adequate resection when the biopsy specimen is reported negative. In no other type of lesion can the exercise of judgment and the application of experience be of greater value to the patient. At the present time we do not resect the rectum because of a diagnosis of grade 1 carcinoma of the papillary type provided that the lesion is below the peritoneal reflection, that it is soft, that there is no fixation to the muscularis and that its size is such that coagulation can include at least 1 cm. of mucosa beyond the tumor and well into the muscularis without serious functional impairment of the rectum.

In five colectomies for diffuse multiple polyposis one to several carcinomas were found in each case, evidence that colectomy for multiple polyposis is not being performed as early as it should.

A brief summary of this series shows that the number of resections with anastomosis has increased with a corresponding decrease in the number of abdominoperineal and Mikulicz type resections. There were no postoperative infections or other complications resulting from the anastomosis.

This and the experience of others indicate that anastomosis is a relatively safe procedure with fewer complications. It is desirable provided that there is no compromise with wide resection. The temptation to restore continuity at the expense of adequate resection is an ever present threat.

TABLE II
HOSPITAL DEATHS IN 242 CASES

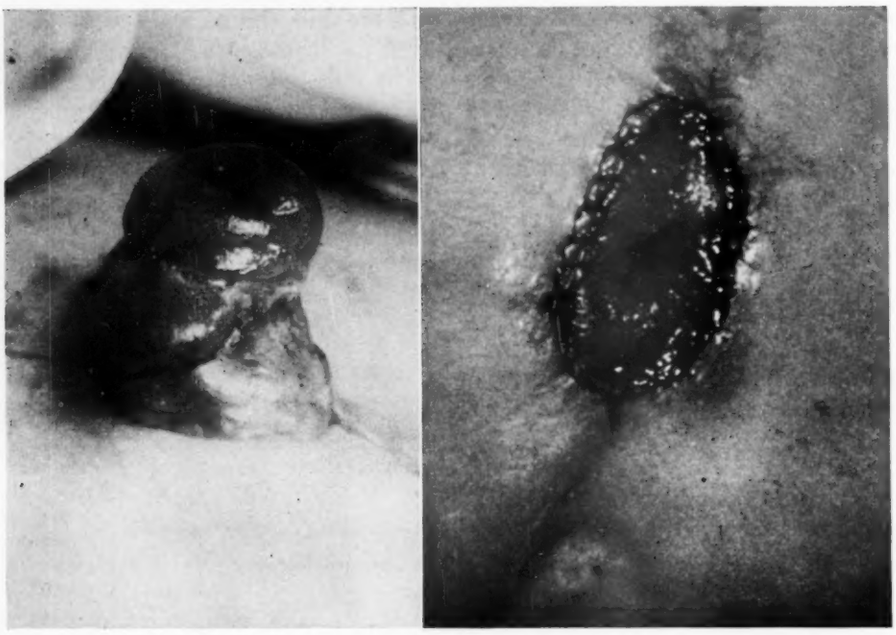
Type of Operation	Deaths	Cause
Abdominoperineal....	1	Transfusion reaction
Anterior resection.....	1	Coronary 11 days
Mikulicz.....	2	10th day postoperative embolism
		33 days postoperative carcinomatosis
Palliative colostomy...	3	Obstruction and peritonitis
		Postoperative carcinomatosis
		Postoperative carcinomatosis

While transcolonic polypectomy does not properly belong in a table dealing with carcinoma, it is included because of the favorable trend it discloses.

Number 12 in Table 1 shows the effect on cancer prevention by early detection of polyps when the roentgenologist becomes especially interested in patients with blood in the stool and makes repeated examinations when necessary by fluoroscopic observation with the barium enema, spot film, post-evacuation film and double contrast by air injection. During the period that the most recent 100 cases of carcinoma (series C) were done by Dr. William Kitchen, there were eleven colotomies for the removal of one or more polyps. There is little doubt that a like number were missed by the roentgenologist in series A and B.

Our pre- and postoperative care and surgical technic varies but little from what may be considered as standard procedure at the present time except in the type of permanent colostomy which is constructed.

Contrary to general opinion, our experience has shown that a protruding portion of bowel is not necessary to prevent stenosis. Trauma to the protruding mucosa by the dressing results in bloody mucus and a bulky dressing is required. With no protruding mass a small incon-



1A 1B

FIG. 1. A, untrimmed colostomy; B, amputated at skin level and mucosa sutured to skin.

spicuous dressing can be worn without trauma to the mucosa.

Experience has proven that the colostomy reconstructed in the manner to be described with mucosa flush with skin is a distinct advance in management. The colostomy is reconstructed a day or two before the patient leaves the hospital; or if considerable edema is present, it is postponed for a time and then reconstructed as an office procedure or at the hospital as an outpatient. (Fig. 1.)

The protruding portion of bowel is removed by first making an incision through the skin close to the bowel wall, then turning the line of incision inward at right angles and amputating the bowel flush with the skin. The mucosa is then sutured to the skin with a running lock stitch made by inserting a cutting needle in through mucosa and out through skin. Accurate apposition results in very little scar and as a result little tendency to contraction. If there has been a tendency to contraction, this can be allowed for by making the opening any size desired during the reconstruction. A healed opening large enough to admit the index finger is less likely to encourage impaction and enables it to be broken up more easily should one occur. While a colostomy life is compatible with normal activity, it is still a handicap and this is one way it can be made more agreeable.

The recent reconstruction of colostomies which had been established several years ago shows by comparison the desirability of such a colostomy stoma.

SUMMARY

1. Three hundred consecutive cases of anorectosigmoid carcinoma are reviewed.

2. Recent trends in the choice of operative procedures are shown by a comparison of three series of 100 cases each. Mortality and complications are reviewed.

3. Finding and removing polypoid lesions of the colon is emphasized.

4. An improved colostomy stoma by secondary reconstruction is described.

DISCUSSION

WALTER A. FANSLER (Minneapolis, Minn.): So far as we are concerned, there are two fundamental curative types of operation for lesions in this area: First, the abdominoperineal resection. This is the most radical procedure and in any case in which local metastases have occurred will offer the greatest percentage of cures in lesions at the rectosigmoid or below. Except for small lesions we use this procedure for all tumors that lie below the rectosigmoid juncture. Second, in the case of relatively small tumors lying above the middle half of the rectum (the 8 to 10 cm. level) we ordinarily do an anterior resection with primary anastomosis with-

out the decompression of a colostomy or cecostomy. As has been stated, in the case of larger growths or when there is evidence of extension to adjacent glands in the perirectal fat we do an abdominoperineal resection. We have done relatively few of the "pull-through" operations but we believe that any case suitable for a "pull-through" operation is equally suitable for an anterior resection and primary anastomosis. In the case of large growths neither the anterior resection with primary anastomosis nor the "pull-through" should be used. In these cases we believe the abdominoperineal resection offers the best chance of cure. Since in our opinion the chance of cure with resection and anastomosis and "pull-through" are about equal, we prefer resection and anastomosis because we believe sphincter control is better and more certain by this method. Sphincter control with the "pull-through" procedure is often uncertain and in some cases practically nil.

In patients whose cure is not anticipated there are several procedures of value. Where there is a very large tumor at the peritoneal reflection or below we sometimes do an abdominoperineal resection. If resection and anastomosis or a "pull-through" operation is done, obstruction may occur from the local recurrence of the growth. If abdominoperineal resection is done, the colostomy is established and there is no necessity for further surgery regardless of the local recurrence in the pelvis.

In patients who have nodes in the liver or have other distant metastases but with a small local tumor we often do an anterior resection with anastomosis. The patient is spared a colostomy, has normal bowel function and probably as long an expectancy as if an abdominoperineal resection were done.

We do not do the Mikulicz operation. I do not believe it is possible to remove as adequate an amount of the mesosigmoid by this method as by mobilizing the bowel and doing an end-to-end anastomosis. If there is a bowel obstruction which cannot be relieved by medical means, we do a transverse colostomy for decompression. Later we do a resection with primary anastomosis, usually closing the colostomy at the same time the resection is done.

In cases in which there is no obstruction but radical operation is contraindicated because of extensive metastases we often do a "precolostomy," that is, we bring a loop of bowel through the abdominal wall but do not open it. After the loop is brought out the patient simply wears a small vasoline dressing over it. If the patient survives any length of time, squamous epithelium will often cover over the entire loop. If obstruction does occur or becomes imminent, the loop of bowel can be opened, with a few drops of novocaine (for anesthesia) in the physician's office. Not infrequently excitus may occur before obstruction intervenes and in this case the patient is spared the inconvenience of a colostomy.

We also do an operation which Dr. Campbell mentioned which has the effect of an abdominoperineal resection. In older persons or extremely bad risks we sometimes simply free up the bowel to a point below the growth, divide the bowel here and remove the growth through the abdominal incision. The rectal stump is left intact. The upper end of the stump is not closed and pelvic peritoneum is closed as in a regular abdominoperineal excision. We think the removal of the rectal stump is of no advantage and does slightly increase the mortality rate. There are of course many circumstances which dictate modification of these procedures but in principle these procedures cover our conception of the situation.

Raymond L. Murdoch (Oklahoma City, Okla.): In reviewing my malignancy resections I find the shift in the type of operations to be very much paralleling that of Drs. Campbell and Schaerrer. Early, there was a trend from multiple to one-stage removals, which was augmented by the performance of increasing numbers of resections with primary anastomosis in good condition patients presenting an empty bowel at laparotomy. It is usually possible to leave a soft rubber tube through the anastomosis and not have to do enterostomy of any type proximal. It is interesting but not significant that most of the initial cases given a low primary anastomosis were females.

A division point in my work was a tour in the military service. Prior to that, I had hunted for cases on which to do the "pull-through" operation, even some in which the anus had to be widely removed. From subsequent observation, I want to condemn the perineal colostomy. The preference is for primary anastomosis rather than a "pull-through," which latter we are now doing infrefrequently. The Miles one-stage combined abdominoperineal continues to be outstandingly most applicable, and certainly the choice in growths in the lower two-thirds of the rectum.

We believe there is much merit in getting the cancerous viscus out at the first operation. Accordingly, tedious performance of a Mikulicz, even though the proximal bowel is distended, has been chosen numerous times rather than the proximal colostomy or cecostomy.

The following case might illustrate the aggravations and difficulties when multiple-stage operations have to be used. A white female had massing in the pelvis. A barium enema indicated much obstruction in the pelvic colon, but the proctosigmoidoscope could not visualize it for biopsy. A midline abdominal incision was made. The mass was extensive in the pelvis, with a couple of hard masses in the pelvic colon as it turned and was tightly ad-

hered to the uterus and adnexa. It was believed that a multiple-stage operation should be done. A lump on the peritoneum at the growth was taken for frozen section, report on which was inflammation and fibrosis. We were then in a situation in which we could not tell, with the benign report on the frozen section, whether we had a diverticulitis mass or malignancy.

Colostomy was done widely separating the stomas. We had some good luck from then on. The patient had a hemorrhage into the bedpan about three days afterward. A very alert nursing service thought they detected tissue, which was sent for microscopic examination, and the report was papillary adenocarcinoma. Accordingly, thirteen days after the first operation, the abdomen was re-entered through a lower abdominal transverse incision that included the lower stoma, and the block of tissue removed included uterus and growth-bearing bowel grown into it, with adherent adnexa, and probably some ureter. At least in the defect we found open ends of left ureter which were anastomosed and a rubber tube cul-de-sac drain established out of the vagina. The postoperative course was satisfactory with intermittent vaginal drainage which ultimately dried up.

We must conclude that multiple-stage operations have some place if most cancers are to be removed.

CYTOLOGIC DIAGNOSIS OF MALIGNANCIES OF THE LOWER BOWEL AND RECTUM*

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TO make a diagnosis by the cytologic method necessitates the presence of cells in the medium from which the smear is taken. Fremont-Smith, et al.[1] point out that almost a continuous exfoliation of cells occurs from every epithelial surface of the body. It is likely that tumor cells are desquamated at even a higher rate than normal cells due to the more rapid rate of growth of neoplasms. Papanicolaou[2] stressed the value of the smear technic in the diagnosis of those neoplasms having a free surface. While originally he was primarily concerned with the cytologic study of vaginal secretions in the diagnosis of uterine or cervical cancer, his work has also served as a basis for an extension of the method to include examination of materials collected from urine,[3] lungs[4] and stomach[5] with varying degrees of success. Ferguson,[6] on the other hand, has cited evidence which would indicate that the cytologic method has limited applications and that the cell changes which are supposed to characterize a malignancy are also produced by other conditions which are not neoplastic.

However, it appears logical to assume that smears taken at proctoscopy and sigmoidoscopy from the lower bowel, sigmoid and rectum might yield diagnostic information if examined for malignant cells. If such cells could be found in discharges from the tumor or in accumulated secretions within reach of the examining instrument, lesions beyond the area of visualization might be diagnosed. Such a possibility was suggested by Hunter and Richardson[7] on the basis that both normal and neoplastic epithelium is well preserved for a time in the lower colonic mucus. Bercovitz[8,9] studied the cytologic pattern of rectal discharges in both normal and diseased conditions. He concluded that the normal bowel discharge contained few, if any cells, whereas various types of cells were found in many pathologic conditions. He did not claim to have seen malignant cells although he studied a case of bowel carcinoma. Wisseman[10,11] et al. applied the Papanicolaou staining technic to smears taken at proctoscopy and sigmoidoscopy and assert that in the rectum, sigmoid colon and lower descending colon, the smear technic compared favorably with x-ray and sigmoidoscopy with biopsy as a method of diagnosing cancer.

OBJECT OF INVESTIGATION

It was the purpose of this investigation to determine whether the smear technic can be applied to lesions involving the sigmoid and rectal areas on a practical basis so that the smear might be made by the examining physician during routine examinations. The assumption was made that the Papanicolaou technic will demonstrate malignant cells. Our primary objective was to determine whether or not those cells could be found and identified in smears taken from the surface of a tumor and from the mucus and discharges some distance from the lesion.

MATERIALS AND METHODS

The patients selected for this study were those who had or were suspected of having carcinoma and were those seen in routine private practice. They were prepared for sigmoidoscopy with cleansing tap water enemas. The specimen was collected on a cotton swab and smeared on glass slides at the time of the routine examination. The smear thus prepared was fixed before drying had taken place in a solution containing 50 per cent ethyl alcohol (95 per cent) and 50 per cent diethyl ether. Where the lesion was visible, the smear was taken directly from its surface and a biopsy was taken at the same examination. Also when possible, a smear was taken at a distance of about 10 to 15 cm. below the lesion. This material was used to make smears because it was believed that if lesions beyond the reach of the examining instrument were to be diagnosed, malignant cells would have to be demonstrable in secretions found

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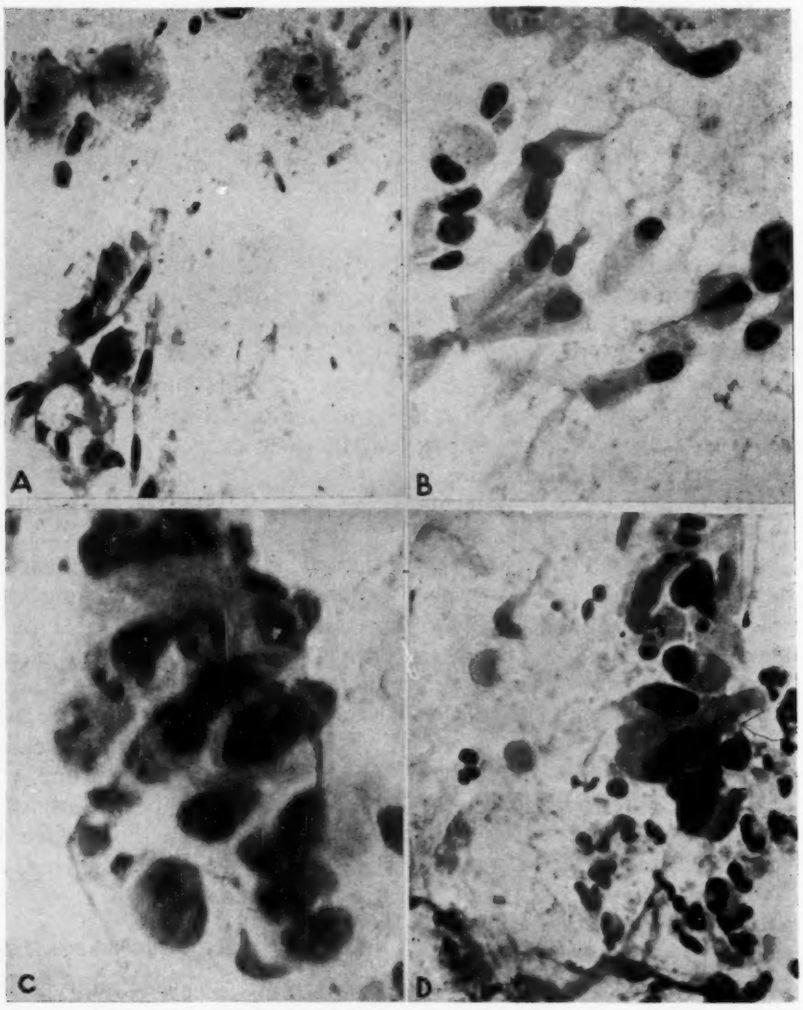

FIG. 1. Smears taken from rectal mucosa or from the surface of new growths and stained by the Papanicolaou technic. A, smear of normal mucosa with anal and rectal superficial mucosal cells; in the left lower field is a goblet cell; B, surface smear of a benign papilloma; note the columnar shape of the cells, the even staining and regular size of nuclei; C, surface smear of adenocarcinoma; note the large size of cells, the irregular shape and nuclear staining and the large nucleoli; D, surface smear of polyp with malignant transformation; note the variation in size of the cells, the tendency toward columnar shape and the irregular nuclei with variation in size.

below the lesion. For the same reason a smear was taken of any suspicious appearing material such as blood-tinged mucus, or from the bowel wall at the highest point visualized when the lesion was beyond the reach of the examining instrument. After fixation the specimen was stained and studied in a manner identical with that used for cytologic study of specimens taken from other body cavities. The diagnosis was considered positive for cancer when cells or groups of cells were found with characteristics of neoplastic cells. (Fig. 1.)

ANALYSIS OF RESULTS

This study involves a series of patients of whom forty-five had a malignancy involving the rectum, rectosigmoid or sigmoid colon. As shown in Table 1, the smear technic showed malignant cells in twenty-nine of these cases. It is noted that in each instance, except one, in which a malignancy could be demonstrated the smear was taken directly from the surface of the lesion. In nineteen of the cases a smear was taken of suspicious appearing discharge a short

distance below the growth. In only one of these was it possible to demonstrate malignant cells. One case showed malignant cells when the smear was taken from the surface of the growth, but none could be identified in the smear made from the bloody discharge about 10 cm. below the same growth. In thirty-four of the proven cancer cases the smear technic failed to show malignant cells, irrespective of the area from which the smear was taken. Not shown in the table are repeat smears taken directly from the surface of the tumor in two cases. These repeats, like the originals, were negative. In three instances in which lesions of the lower sigmoid were demonstrated by x-ray and could not be visualized by sigmoidoscopic examination it was hoped that the smears from the bloody discharge below the lesion might produce information which would assist in arriving at a diagnosis prior to surgery. This was not fulfilled in either of the three cases. The smear in each instance was negative and surgery proved each one to be a malignancy of the sigmoid confirming the x-ray diagnosis.

TABLE I

RESULTS OF SMEAR STUDIES IN PATIENTS WITH LESIONS OF THE LOWER SIGMOID, RECTOSIGMOID AND RECTUM

No. of Patients	Paraffin Section Diagnosis	No. of Patients with Smears from Surface of Lesion Which Were:		Smears from below Lesion	
		Negative	Positive	Negative	Positive
43	Adenocarcinoma (carcinoma by surgery—3)	14	29	18	1
2	Malignant polyp	2	0	..	..
10	Benign polyp	10	0	..	..
3	Benign papilloma	3	0	..	..
4	Inflammatory states	3	0	..	..
2	Amebic colitis	2	0	..	..
2	Diverticulosis	2	0	2	0
Total 66		No false positives		No false positives	
		16 false negatives		18 false negatives	

No false readings were obtained regardless of where the smear was made or what the diagnosis of the lesion was. Patients studied included those with ulcerative colitis, amebic colitis, diverticulitis, proctitis, benign and malignant polyps, benign rectal ulcer, benign papilloma as well as adenocarcinomas.

In Table II a comparison is drawn between the biopsy and the smear technic. In no instance was information of a diagnostic nature produced from a study of the smear that was not shown by the biopsy.

TABLE II

CORRELATION OF BIOPSY STUDIES AND SMEAR TECHNIC

No. of Patients	Biopsy Diagnosis	Smear Diagnosis	Agreement Per cent
10	Benign polyp	Negative for cancer	100
2	Polyp with malignant changes	Negative for cancer	0
40	Adenocarcinoma with varying degrees of invasive properties	14 negative for cancer 26 positive for cancer	65
3	No biopsy possible	Negative for cancer	
3	Benign papilloma	Negative for cancer	100

COMMENT

This investigation would indicate that very little is to be gained by the application of the cytologic examination of rectal and sigmoidal discharges. This view is substantiated by the fact that very little, if any, information was obtained in this study that was not available through the usual methods of examination employing sigmoidoscopy, biopsy and x-ray. This interpretation is in distinct contrast to earlier reports previously cited which indicate the smear technic to be a valuable adjunct in diagnosing lesions of the lower colon, sigmoid and rectal areas. If any knowledge is to be gained from the smear technic, it should be most valuable in those lesions where a biopsy is not possible. In view of the scarcity of cells found when the smear was taken only a short distance below proven malignancies, it does not appear logical to expect to find malignant cells on patients who do not have the usual symptoms of obstruction or bleeding or both. In patients with these symptoms or when blood-tinged mucus is seen coming down beyond the reach of the sigmoidoscope, intensive x-ray examinations would ordinarily be done irrespective of the report of the smear which might have been made.

The very fact that malignant cells were found in material collected below the lesion in one case confirms the contention that such cells are desquamated from the surface of the neoplasm.

The inability to demonstrate the cells in a greater number of cases would indicate that the number of malignant cells is not great enough to permit finding them with any degree of success.

A logical explanation for the apparent absence of these malignant cells may lie in the fact that the bowel has to be prepared if visualization by sigmoidoscopic examination is to be successful. This preparation no doubt washes away the bulk of the accumulated cells. Then, too, it was found that many patients with a carcinoma in the lower sigmoid or rectal regions do not seek medical assistance until symptoms of obstruction are present. Such obstructions often produced the passage of copious amounts of watery fecal matter and this, too, would prevent the accumulation of any cellular exfoliation. Red blood cells were identified in a large percentage of smears taken, whether from the surface of the tumor or from the discharge below the lesion. This could not be looked upon as being significant since many non-cancerous lesions produced the same finding.

The diagnosis of lesions that are visible through a sigmoidoscope is usually tentatively made by inspection alone. The confirmation of this is adequately done by taking a biopsy. It is not uncommon to have to repeat a biopsy before malignant tissue can be demonstrated. This is a point which should be emphasized when expecting to diagnose a malignancy by examining only the cells which are exfoliated or smeared from the surface. In many instances the malignant changes are not to be found on the surface of the growth but within the deeper portion.

SUMMARY

1. Malignant cells were demonstrated in smears taken directly from the surface of neoplastic growths in the rectum or sigmoid in 65 per cent of cases examined.

2. Only one out of nineteen cases showed malignant cells when the smear was taken from a discharge below the lesion.

3. A possible explanation is given for the apparent absence of neoplastic cells in areas below malignancies of the sigmoid and rectal areas.

4. With the methods used in this investigation, the smear technic was of no aid to ordinary diagnostic procedures.

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DISCUSSION

Isaac E. Harris (Durham, N. C.): Dr. Blank is to be congratulated upon a well presented, informative paper embodying original research. He and Dr. Steinberg have made an extensive study of this subject based upon adequate material; and even though their results are chiefly negative, it is valuable and needed information. Positive findings are very pleasing and important, but too often negative results are given very little attention, yet they can be just as important, and usually require more work, energy, time and thought.

He has presented this subject so well that little room is left for discussion. Since the introduction of cytologic diagnosis of cancer the importance of interpretation of the slides has been stressed repeatedly, and the lack of individuals with sufficient training and experience to interpret them has limited its general use.

It is important to note that they had no false readings, and this was true of a report of a similar study of gastric washings presented by Rosenthal and Skaden last week at the A. M. A. meeting.

False positive readings have lessened its value with other studies with which I am familiar.

The fact that 64.4 per cent were positive when the smears were taken directly from the surface of the lesions means that this procedure may be of some value in the differential diagnosis of lesions of the anal and perianal regions, when biopsy is not convenient. We occasionally make a diagnosis of cancer of these regions by cytologic studies in our cancer detection and diagnostic clinics, which I am sure would have been missed otherwise. But I believe no one should make a final diagnosis of malignancy until proven by biopsy and pathologic study.

As has been brought out, proctosigmoidoscopy and biopsy for diagnosis of malignancy of the rectum and lower sigmoid is adequate and dependable. But to re-emphasize what Dr. Blank has already said, it is not unusual to have to perform more than one biopsy before a satisfactory diagnosis can be made. We recently had a patient with a large degenerative polyp of the sigmoid in which the diagnosis of malignancy was not definitely made until after segmental resection in spite of several different biopsies preoperatively.

Even though we have adequate and dependable means of diagnosing cancer of the rectum and sigmoid, namely, proctosigmoidoscopy and biopsy which is thoroughly used by every member of this organization, we still have an enormous task of selling this fact to the other members of our profession. For example, in our hospital in 1949 over 1,380 barium enemas were performed but only 165 recorded proctosigmoidoscopies.

What we need is a better, more reliable and simpler means of diagnosing lesions of the large bowel above the reach of the scope, such as early malignancy, diverticulitis, ulcerative colitis, etc., and especially cancer superimposed upon the latter two. It is too bad this study failed to show reliable cytologic diagnosis of lesions beyond the reach of the scope, but scientific facts are facts, and we still have to depend upon history, physical findings and x-ray studies for diagnosis of such lesions. With research of this nature it is hoped that not too far in the future a more reliable and practical means of diagnosing cancer of the colon will be discovered.

Papers Read by Title

PRACTICAL CONSIDERATIONS IN THE TREATMENT OF ANORECTAL FISTULAS

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THERE is considerable unanimity of opinion concerning many aspects of the problem of anorectal fistulas. However, it is believed that the importance of the crypts of Morgagni as the usual source of infection leading to abscess and subsequent fistula formation may well be re-emphasized.

Etiology. The anorectal area is especially vulnerable to inflammatory and suppurative processes because of the abundant areolar and fatty tissue, the rich lymphatic drainage and the constant contamination of the region. Furthermore, the terminal portion of the alimentary tract is subject to trauma by ingested foreign bodies and roughage in the diet. In addition to these factors the human race seems particularly prone to the introduction of foreign objects into the anal canal either by accident or for therapeutic or other reasons. Such objects not only may provide the original source of injury but also may break down the normal barriers to the spread of infection. Moreover, various ulcerative processes such as lymphogranuloma venereum, tuberculosis and malignant disease may erode the bowel wall to create avenues for the dissemination of infection. Likewise, chemical agents applied to or injected beneath the surface may sufficiently devitalize the tissues to allow infective processes to develop. Irradiation, injections of oil-soluble anesthetics and electrocoagulation are agents of this type.

Whatever the originating factor the immediate cause of abscess and fistula formation is infection. Most pathogenic organisms of the intestinal flora are capable of producing a suppurative process once they have been introduced into the submucous or subcutaneous tissues by one of the means described before.

The pathologic process resulting ultimately in fistula-in-ano usually originates in a crypt of Morgagni. As demonstrated by Helwig,[1] Nesselrod[2] and others, infection travels along the branching tubular glands or anal ducts and perivascular spaces, muscular and fascial planes and the loose tissues of the submucous and subcutaneous spaces. However innocuous an inflamed anal crypt may appear, it should be given careful consideration, as not only fistulas but various other pathogenic processes arise in this site. The normal crypt is little more than a shallow depression which will hardly accept the tip of a standard probe. Once a crypt has become sufficiently enlarged to form a pocket several millimeters deep, it is the opinion of the author that it should be excised as a potential source of deep infection.

Early recognition of an anorectal abscess with prompt and adequate drainage will tend to prevent the development of a complex branching fistula. The practice of waiting for an abscess to open directly under the skin permits extension of the disease by means of unnecessary degrees of pressure and necrosis. It also causes undue suffering for the patient.

TREATMENT OF ANORECTAL ABSCESS

The rare abscess which is confined to the submucosa should be incised in the longitudinal axis of the bowel from its cephalad extremity through the primary opening at the anorectal line. Also, the incision should be carried out onto the perianal skin. A rubber dam drain is inserted for not more than forty-eight hours. Properly performed, this procedure will cure the patient without the necessity for a second operation.

Ischiorectal abscesses are opened through an anteroposterior incision over the entire extent of the cavity but avoiding the external anal

sphincter. The lateral skin edges and protruding necrotic fat are excised in order to provide more adequate drainage, and iodoform gauze is lightly packed into the wound.

Pelvirectal abscesses, being supralevator, are contiguous to the vagina, rectum and bladder, and if neglected may extend into the retroperitoneal space. For these reasons such abscesses can assume serious proportions with considerable systemic effects. Drainage is accomplished through the same approach as that used for ischiorectal abscess with the additional necessity of perforating the levator ani and its investing fascial layers. After the initial incision, with a finger in the rectum as a guide, a closed hemostat is passed through the ischiorectal fossa and thrust through the levator fibers. The instrument is withdrawn with its blades open thus creating a wide separation of the muscle fibers. A large cigarette drain is inserted to the depth of the cavity.

Retrorectal abscesses are opened through a slightly oblique anteroposterior incision on one side of the anococcygeal ligament. The exploring hemostat is advanced hugging the hollow of the sacrum, and the abscess is otherwise handled in the same manner as the pelvirectal variety.

It is usually not expedient to attempt to prepare the bowel prior to incision and drainage for infralevator abscesses. In the supralevator variety, however, a saline enema before operation may facilitate manipulation of the finger placed in the rectum as a guide.

Postoperative care in cases with considerable febrile reaction should include the use of sulfonamides and antibiotics in addition to general supportive measures. On the first postoperative day the outer dressings are removed and hot compresses of equal parts of witch hazel and boric acid are constantly applied. As soon as the patient's condition permits, he is allowed out of bed and hot sitz baths are administered two or three times daily. Ordinarily, the iodoform gauze packing will become partially loosened in the bath, thus facilitating its removal. All packing is removed by the third day, including the cigarette drain if present. This is followed by the insertion of gauze impregnated with furacin ointment to stimulate healthy granulations.

Since the successful treatment of anorectal fistulas is dependent upon adequate drainage of the internal or primary opening, the demonstration of this opening becomes of importance. In most instances Goodsall's rule applies and furnishes the examiner with a clue to the probable site of the internal opening based upon the location of the external opening. This rule is more reliable in those patients who have had only one abscess which has been promptly drained. A history of repeated abscesses which have ruptured spontaneously should lead the surgeon to expect multiple tracts sometimes opening externally as far afield as the scrotum, labia majora or even on the opposite side of the anus.

Examination. Following inspection the examination should continue with a careful palpation of the area. This will often lead to the discovery of an indurated, cord-like, fistulous tract which may actually point the way to the internal opening. In other instances this phase of the examination may lead to another source of infection such as a pilonidal sinus or an infected Bartholin's gland.

Next in order is anoscopy. Introduction of the anoscope will sometimes express a drop of pus sufficient to identify the primary opening. More often, however, it is necessary to examine the anal canal completely, carefully exploring each crypt. Occasionally the presence of a small tuft of granulation tissue or some degree of induration may indicate the stoma. Introduction of a probe through the external opening may create a false passage. However, a diluted solution of methyl blue in hydrogen peroxide (1:8) may be instilled into the external opening under very slight pressure. This frequently will indicate the primary opening with little chance of being forced into uninvolved tissue.

The ramifications of complex fistulous tracts may be delineated by stereoscopic x-rays following the injection of lipiodol. Care must be exercised to avoid spillage of the radiopaque substance on the skin. Should this occur, it may produce a misleading shadow on the x-ray plate.

Treatment. The cure of anorectal fistulas requires surgery with eradication of the internal opening and removal or adequate drainage of the tract. This should be accomplished without the creation of incontinence or disabling deformity.

Simple superficial fistulas may be excised in their entirety. Beginning at the internal opening, the tract is removed in such a manner as to leave a widely open trough, using an

advancing crypt hook as a guide. Mucosal edges are then brought down and anchored transversely at the level of the anorectal line with interrupted sutures of No. 00 plain catgut. This avoids the creation of a submucous pocket and leaves a minimal amount of raw wound surface within the grasp of the sphincter.

When the tract has undermined a major portion of the external sphincter, incision may wholly or partially replace excision. In such cases it is well to excise at least part of the external end of the fistulous tract and thoroughly to curette the remainder.

Horseshoe and other complex fistulas with multiple openings are treated in the same manner, the tracts being excised and widely drained or thoroughly curetted. Ordinarily, only one internal opening will be found into which all the ramifying tracts will lead. Should the inner end of the tract run beneath the entire external sphincter, the operation is performed as described before, except that the muscle is only partially divided. The remaining intact portion is surrounded by a loose silk seton and divided at a later operation after the external wound has healed. When it is necessary to divide all or part of the external sphincter, the incision should be made at right angles to the direction of the muscle fibers and in only one place. It is ordinarily not advisable to attempt definitive cure of the fistula at the time of drainage of the original abscess unless the tract leading to the primary opening is both obvious and superficial.

At the completion of the operation the wound is packed lightly with iodoform gauze and a strip of gelfoam is inserted into the anal phase of the wound.

Postoperative Care. Liquids are ordered the day of operation and a full diet on the following day. A half ounce of mineral oil and a teaspoon of metamucil in 8 ounces of water are prescribed to be used twice daily beginning the first postoperative night. The mineral oil is discontinued following the first bowel evacuation, but metamucil is continued until healing is completed. On the first postoperative day the patient is permitted out of bed, witch hazel and boric acid compresses are applied, and hot sitz baths are ordered three times daily. The gauze packing will usually be loosened by the first sitz bath which thus facilitates its removal.

On the third postoperative day, if satisfactory evacuation has not already taken place, a retention enema of 8 ounces of cottonseed oil is administered. If adequate evacuation follows, the patient is discharged from the hospital, provided his condition is satisfactory.

Following discharge from the hospital hot sitz baths are continued several times daily and the patient is taught to place gauze impregnated with furacin ointment in the depths of the external wound. The wounds are dressed in the office every few days until healed, special attention being paid to the prevention of bridging and pocketing.

SUMMARY

1. Since the crypts of Morgagni constitute the principal source of infection leading to anorectal fistulas, surgical eradication of markedly inflamed crypts is advocated as a preventive measure.

2. Anorectal abscesses should be promptly and adequately drained, fistulectomy being often performed simultaneously, using the radio knife, unless most or all fibers of the sphincter are undermined. Intraluminal drainage is only used in submucosal abscess.

3. Palpation to determine the course of a suspected fistulous tract in addition to exploration of all crypts will often lead to the discovery of the primary opening. Dyes are used only to identify the primary opening when other measures fail. Radiopaque substances and x-rays are used to delineate complex and complicated tracts and for differential diagnosis.

4. Fistulectomy is performed with a radio knife about an advancing crypt hook, starting at the primary opening. When communicating tracts on the opposite side are present, excision is begun in the latter at the most remote opening and carried almost to the original wound. A seton is applied to the remaining portion of the tract and division completed at a later date.

5. The use of a silk seton as a marker for the individual portion of tract in deep fistulas is emphasized.

6. Postoperative care has been discussed.

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CARCINOMA OF THE COLON

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BECAUSE a better prognosis is to be offered the patient with carcinoma of the colon or rectum than the patient with any other cancer in the abdomen, it seems fitting that this subject be brought to our attention as often as practical. Morphologically, the colon is divided into right and left segments. The physiology and anatomy of the right and left colons are also different, the right colon being large in diameter with a thin wall and the left colon small in diameter with a thick wall. The right colon is largely concerned with the function of water absorption while the left side is a storehouse for semi-solid stool. Interestingly enough the type of growth found in the right side of the colon is usually a fungating type of tumor which protrudes into the lumen of the bowel, whereas tumors of the left side of the colon are usually an invasive type of growth with a tendency to encircle the bowel, presenting the "napkin-ring" type of carcinoma or the seromuscular puckering so often seen on opening the abdomen which causes early obstruction. It is also interesting to note that tumors on the right side of the colon ulcerate late while ulceration is reasonably early on the left side, the anatomy and physiology no doubt having much to do with these differences.

Since the aforementioned is true, it is readily understood why obstruction is delayed in a right-sided lesion in contrast to being early in a left-sided lesion. Bleeding is noted early with lesions in the left colon and delayed with lesions on the right side. Right-sided lesions exhibit a disturbed physiology as an early sign such as diarrhea and anemia, whereas left-sided lesions exhibit early obstructive symptoms and blood in the stools. Fixation, infection and even perforation are seen more often on the left side than on the right side. For these reasons one often diagnoses a right-sided lesion on a routine physical examination because of palpable asymptomatic tumor before signs and symptoms have manifested themselves. Another pertinent observation is that cancer of the right side of the colon when removed has so far given the greatest number of patients a five-year survival.

Mikulicz, although not the first to perform the exteriorization type of operation for carcinoma of the colon, was the first to report a group of cases in which patients were treated in this manner. Since his time efforts have been directed toward improving this procedure; yet today it is with its modifications perhaps the safest method that we possess. It seemed sufficiently radical, offered the lowest mortality, and the morbidity seemed justifiable. However, it was found inadequate for the obese individual with a short mesentery. This stimulated thought toward finding a method for resection with immediate anastomosis. It was recognized early that a normal bowel and asepsis were necessary for a secure anastomosis. This presented the problem of how to care for a distended bowel proximal to the anastomosis. It is not known who first instituted bowel drainage, but according to Rankin,[1] Littre in 1710 performed a colostomy for relief of obstruction due to a congenital anomaly of the rectum. However, it was Pillore of Rouen sixty-six years later who performed a right inguinal colostomy for obstruction of the rectum due to a neoplasm. Hartwell[2] in 1917 reported performing a colostomy on a patient with an obstruction of the large bowel. The patient improved and was later found to have carcinoma of the splenic flexure which was resected and the patient survived. This was perhaps one of the first decompression procedures for a subsequent resection. Since then numerous procedures including cecostomy, appendicostomy and transverse and sigmoidal colostomy with their many modifications have been used. These procedures have grown in popularity until it is now possible to remove a cancer which would otherwise be inoperable. Other valuable adjuncts to our armamentarium are decompression by use of the Miller-Abbott tube or Levine tube, vitamins, blood transfusions and fluid and electrolyte balance.

Carcinoma of the colon may or may not be

associated with bowel obstruction. If obstruction is present, separate measures may be indicated for the relief of this complication before resection can be safely performed. Carcinoma of the colon without obstruction may or may not be infected and may or may not be attached to the surrounding structures. Thorough cleansing of the intestinal tract followed with the administration of one of the intestinal bacteriocides, sulfasuxadine or sulfathaladine, readies the non-obstructed bowel for resection. This preparation requires five to seven days during which time blood and protein in sufficient quantities may be given. Vitamin K should be administered since it may be depleted due to the destruction of the bacteria in the large bowel when giving sulfathaladine or sulfasuxadine. Thiamin in adequate doses should also be given. A decompression tube when used should be put down twenty-four to forty-eight hours prior to surgery. However, there are many who no longer use the tube with primary anastomosis. If the bowel is properly prepared, personal preference will determine whether or not an open or closed type of anastomosis will be used.

Carcinoma with obstruction presents a different problem, particularly when infection is present or there is an invasion or fixation to the adjacent structures. The bowel proximal to the obstruction should be decompressed by performing a colostomy or cecostomy and allowing sufficient time to elapse, usually about fourteen days, for the edema and infection to subside. This affords the best chance for mobilization, permits the infection to subside and provides normal bowel for the anastomosis.

Resection of the right and left sides of the colon are managed differently because of the difference in their anatomy and physiology. As mentioned previously the five-year survival rate is higher in a right hemicolectomy than that on the left side of the colon. This may be due in part to the more radical resection on the right since the entire right half of the colon is removed, whereas carcinoma of the left colon is removed by segmental resections. For this reason more radical resections of lesions of the left side of the colon may be a means of achieving a higher percentage of five-year survivals.

As previously mentioned a complete right hemicolectomy is the operation of choice in the treatment of carcinoma of the cecum or right colon with an ileotransverse colostomy. This type of resection may be performed in either one or two stages. When the two-stage procedure is employed, two weeks is usually sufficient between the first and second stage. This method has its virtues when one performs only an occasional resection for carcinoma of the cecum or right bowel. An ileotransverse colostomy may be performed by doing a side-to-side, end-to-side or end-to-end anastomosis, with resection of the right colon to be performed about fourteen days later. When the side-to-side anastomosis is used, care should be taken at the time of resection to avoid leaving a blind pouch at the closed end of the colon since a fecalith may form requiring a subsequent operation for removal. It is also essential to suture the free edges of the mesentery of the large bowel and small bowel to prevent a loop of ileum from sliding between these mesenteric borders producing a mechanical ileus. The type of anastomosis, whether open or closed, and the technic will depend upon the individual's preference. A decompression tube, either Miller-Abbott or Levine, may or may not be used in primary or secondary anastomosis depending upon the operator's preference. Either should be passed twenty-four hours prior to surgery with Wangensteen suction carried on during surgery. Passage of the Miller-Abbott tube sometimes requires observation and frequent use of the fluoroscope. It is preferable to put 5 cc. of mercury in the rubber bag to facilitate passage.

The Levine tube is likewise employed during the operation and subsequent to the operation with the thought in mind that if there is no distention before surgery and the Levine tube is kept open and working with Wangensteen suction there will be no distention after surgery. However, care should be taken that the tube is not coiled and just touches the bottom of the stomach. In this way water may be administered to the patients a short time after surgery, which materially aids their comfort. An objection might be depletion of the blood chlorides, but this can be carefully watched by doing daily blood chlorides which will as a rule stay within the lower limits of normal if the tube is left down only forty-eight to seventy-two hours providing they were at a normal level prior to surgery. It is likewise important that these tubes should be checked at regular intervals in order to see that they are working properly.

I also wish to make mention of Doctor Lahey's contribution in dealing with right colon lesions. He recommended a Mikulicz type of ileotransverse colostomy. This method has its place in right colon resections, but with present day antibiotics and bacteriocides and our knowledge of electrolytes and fluid balance its use is limited.

Still a different situation is presented by carcinoma of the transverse colon since the middle colic artery supplies the left half of the transverse colon. Here a Mikulicz type of resection may be employed or an end-to-end anastomosis, taking care that the blood supply is adequate in the ends of the bowel. This may require the freeing of both the hepatic and splenic flexures when adequate resection is performed since all nodes along the middle colic artery should be removed. When obstruction is present with transverse colon lesions, a preliminary cecostomy is the procedure of choice since a right transverse colostomy would interfere with mobilization of the transverse colon at the time of resection.

The splenic flexure carcinoma is a lesion that is frequently diagnosed late since the left extremity of the transverse colon is superimposed on the upper end of the descending colon. These lesions are therefore more susceptible to infection, fixation and obstruction. A right transverse colostomy is preferable for proximal drainage, with resection approximately fourteen days later. Exposure of this lesion is often difficult and may require a transverse subcostal incision. Blood supply again is at times sparse, and a transverse incision in the mesentery may be preferable to avoid injury to the ligament of Trietz. Here again either the Mikulicz or primary end-to-end anastomosis following resection may be used.

Non-obstructing carcinoma of the descending and sigmoid colon likewise may be resected with primary anastomosis or with a Mikulicz type of resection. Since it is in this region that most obstructing lesions occur when obstruction is present, one should do a preliminary transverse colostomy, either right or left, and complete the procedure about fourteen days later by one of the aforementioned procedures. Resection with end-to-end anastomosis is performed with little hazard in the presence of a previously performed colostomy.

Low sigmoidal and upper rectal lesions may be cared for in one of three ways: (1) anterior resection with cigarette drain in the presacral region placed through a stab wound in the anococcygeal region with or without a transverse colostomy for proximal decompression; (2) Miles' combined abdominoperineal resection; (3) the Babcock type of proctosigmoidectomy or the so-called "pull-through" type of operation. Considerable controversy is prevalent as to which procedure is the most practical.

Gilchrist and Vernon David of Chicago have made one of the most comprehensive studies of carcinoma of the colon and rectum. They emphasized from their study the need for the widest possible resection in carcinoma of the colon and lesions which were partly or completely below the peritoneal reflection since lesions in this area had a high incidence of local and liver recurrence. The authors believed that the "pull-through" or "sleeve" resection was not much better than a local resection[3] and that the Miles-resection gave the best chance of cure. It is not, Can you sew the cut ends of the bowel together? but Can you remove all the cancer?[4] Nodes are frequently found 2 to 5 cm. below the lesion indicating the most radical procedure is likewise the most conservative one.

Because of inadequate examinations patients have had a hemorrhoidectomy some three to six months prior to a diagnosis of cancer of the rectum or colon, which certainly decreases their chances of being cured. Too, when we realize that 50 per cent of those patients in whom the procedure has been sufficiently radical are living at the end of five years, the importance of our responsibility toward early diagnosis is realized. Finally when we realize that 55 to 60 per cent of these cancers are within reach of the index finger, the least any physician can do when examining a patient is a digital examination. That early diagnosis is essential to achieve the most in any patient with cancer is unquestioned. Therefore, for any patient who presents symptoms or signs of possible malignancy such as blood, mucus or pus in the stool, change in bowel habits or vague abdominal distress, it is imperative that a digital examination, anoscopic and sigmoidoscopic examination followed with a barium enema with air-contrast study be done. It should be emphasized that fluoroscopy is a most essential part of an x-ray study of the

colon and that barium alone by mouth is insufficient. We must also remember that x-rays are shadows and it is often necessary to repeat colon studies. A good rule is to delay surgery until x-ray findings can be duplicated, particularly if polyps are suspected.

CONCLUSIONS

1. The morphology of the right and left colon has much to do with the difference in the type of carcinoma encountered in the two sides.

2. Early diagnosis is essential to increase the five-year survival rate.

3. Management of carcinoma of the colon has been discussed.

4. The widest possible resection in carcinoma of the colon and lesions which are partly or completely below the peritoneal reflection should be performed.

5. Management of carcinoma of the colon and rectum will depend on the presence or absence of obstruction, fixation and infection. Each must be dealt with separately. Lastly, the location of the tumor will likewise determine the procedure to be followed.

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Scientific Round Table Luncheon

QUESTION: What is the best treatment for advanced granulomatous stricture of the rectum?

ANSWER BY DR. FREDERICK CAMPBELL (Kansas City, Mo.): The only treatment that I know is abdominoperineal resection for advanced lesions of that type. I think that someone from farther south might answer that to better advantage because, while being from Missouri we are considered to be rebels, we still have a lot of yankee characteristics and see very little lymphogranuloma or granulomatous strictures in our territory.

QUESTION: Please comment upon the use of alcohol injections as an office procedure for pruritus ani.

ANSWER: I do not believe that alcohol injections are suitable for use as an office procedure. I believe that they are better undertaken in the hospital. Although I do not use alcohol at the present time, I have in the past. But in those cases in which we are unable to make a diagnosis or in which our therapy fails with or without a diagnosis, we do an undercutting operation.

QUESTION: Please discuss treatment of a thirty-five year old male recovering from his third attack of chronic ulcerative colitis in three years, and in whom severe bleeding has persisted for twenty-four hours. No bleeding point is visible on sigmoidoscopic observation. Transfusions have been given and this is the first occurrence of massive bleeding.

ANSWER: Trying to answer a question of this kind extemporaneously is sometimes easier than giving the answer with the patient before you. Massive hemorrhage is always an indication for emergency treatment in ulcerative colitis. It is always a bad sign and, without knowing more about the particular case, I think that some type of surgery should be done.

I would explore the bowel very carefully to determine, if possible, whether colitis extended into the transverse colon. If the transverse colon looked fairly good, I should do a transverse colostomy. If the transverse colon was involved, with rigidity and other evidence of acute or chronic inflammation, I would then do an ileostomy. But, if possible, I would do the transverse colostomy because the chances of recovery postoperatively are so much better, you have less disturbance of the fluid balance and you can pull your patient through this emergency and then get set to do what you think should be done later.

QUESTION: What is your opinion of the use of oil-soluble anesthetics at the time of operation?

ANSWER BY DR. LOUIS BUIE (Rochester, Minn.): I cannot give you any information based on experience. One of the complications which follows the use of oil-soluble anesthetics is abscess. I am sure that many of you have observed the deformities of the lower portion of the rectum about which Dr. Curtice Rosser wrote some years ago. The giant cell forms indicate that the oil acts as a foreign body, and you have observed the developments which have sometimes been mistaken for malignant involvement.

As long as we have morphine I prefer it. It is cheap, most patients can take it and it usually keeps them from having discomfort.

QUESTION: Please describe briefly the presently accepted therapy for chronic ulcerative colitis.

ANSWER: The term "presently accepted" infers, I believe, that the author of this question believes there is some uniformity in connection with the treatment of ulcerative colitis. During the many years that I have been looking through proctoscopes and have been hearing what others have to say after they have looked through proctoscopes, I have wondered what would happen if we could all look through the same proctoscope. I wonder even more when I observe the results which are reported in large series of cases in which colectomy has been performed on patients with active, chronic, ulcerative colitis.

I believe there is one point of uniformity with regard to chronic ulcerative colitis and that is the confusion which has been present in the minds of those who have diligently sought to attack the problem.

Now at any meeting where there are internists, gastroenterologists, surgeons, proctologists

and allergists you hear discussion. One believes that he can clarify the problem by attacking it from the standpoint of allergy. He deals with his patients on that basis and they get well, or a satisfactory percentage of them do. There are those who talk about avitaminosis. Then there are individuals who cling to the old fashioned methods. Without control tests we have no way of telling whether the patient is cured or whether he is in a period of remission. We utilize high protein diet, rest and sedatives, which I think is pretty good treatment. These are the methods of the physician who practices the art of medicine. I doubt that there is any presently accepted treatment for chronic ulcerative colitis.

I heard an eminent surgeon speak about ulcerative colitis. He dwelt on the danger of the development of malignancy in ulcerative colitis. That was the point about which he was more concerned than anything else, and certainly we are all concerned about it. When cancer is engrafted in the colon of patients who have ulcerative colitis, it is probably of the most malignant form. This surgeon brought out the fact that he was continually fearful of the possibility of this complication of malignancy in ulcerative colitis; and my impression, when he had finished, was that he performed colectomies almost universally because he believed that the danger of developing malignancy warranted this attitude.

I would not take issue with this surgeon, but I was afraid he had conveyed the impression that he had to perform colectomy on almost all patients who had ulcerative colitis (because of the malignant potentiality). After I made several inquiries he clarified the matter by saying he performed colectomy on about 40 per cent of his patients. He mentioned such indications for colectomy as hemorrhage, perforation and factors of that kind in addition to the factor of malignancy.

Therefore, in response to this somewhat perplexing question, I would say that we should utilize various modern methods. I do not know what our experience will prove. These methods are all entitled to our consideration and, in view of the fact that we have no presently accepted treatment for ulcerative colitis which will apply to all cases, I think I am correct when I say that we are still where we used to be—confused and willing to practice the art of medicine. That is the best answer I can give to that question.

QUESTION: What is the significance of the dry tongue when a patient is receiving daily 2,000 cc. of glucose and water and 1,000 cc. of normal saline intravenously?

ANSWER BY DR. RALPH HOMANN (Los Angeles, Calif.): In all of these cases there are a number of ways to look at the problem. A dry tongue may be one of two things: (1) it could be dehydration or (2) it could be a mouth breather, and either one of these is very important.

In dehydration the patient may be losing more than 1 L. of gastric fluid, 1 L. of diarrhea fluid or whatever you will, so that giving him 1 L. of saline a day may not be sufficient. We have seen some people on nasogastric suction put out what is comparable to 2, 3 or 4 L. of sodium chloride. Therefore, some may have to be on 2 or 3 L. of saline a day to keep abreast of the loss.

The second important possibility is the mouth breather. This brings out the advisability of checking over the patient more completely at times than we might otherwise do. I remember well one patient who was admitted in alkalosis and who appeared to be dehydrated. He was treated with ammonium chloride and his alkalosis disappeared, but his tongue remained dry. It was assumed that this patient was dehydrated and he was given more normal saline but the tongue was still dry. After two days or so he began to have difficulty breathing and died rather shortly thereafter. He died of hypertensive disease and congestive failure; he had edema up to his knees and fluid in both lung bases. This patient, unfortunately, was breathing through his mouth, therefore he had a dry tongue. He was not dehydrated but received too much fluid.

You have to see the whole picture with these patients; just checking their tongues is not the answer to the problem. You have to check the presence of edema and listen to the lungs, etc., to see what is the state of hydration. This patient's non-protein nitrogen was elevated moderately which, as you know, may happen in congestive failure. It is one of the exceptions to the rule that the non-protein nitrogen will also measure what we usually think of as dehydration.

QUESTION: Is the use of ammonium chloride to replace chloride ion routine or is it employed only when kidney function is depressed?

ANSWER: The latter is usually the case when there is depressed kidney function. I might qualify that a little bit and state that if we have an individual who has such severe

alkalosis that it appears as though he may die within twelve or twenty-four hours, we can get much better results giving him ammonium chloride. There may be mild renal impairment. I can think of one case of renal impairment in which the non-protein nitrogen was somewhere between 40 and 50, not elevated very much. This patient had a CO_2 combining power somewhat greater than 150 volumes per cent. He was given 3 L. of normal saline and on the following day his CO_2 combining power was just a little less than 150 volumes per cent. One L. of ammonium chloride brought his CO_2 combining power near 100; a second L. brought it down to the limits of normal.

A thing to remember is that if you have dehydration plus alkalosis, which is the usual state, the kidney will not correct the state of alkalosis until the individual is hydrated. In order to correct the state of alkalosis, the kidney must throw away base in the urine. As long as the patient is dehydrated the body will not throw base away but it will save base and correct the state of dehydration before it corrects the state of alkalosis. For that reason ammonium chloride is indicated in most of these people who have severe symptoms.

It is of interest to note that the individual who has this type of alkalosis puts out an acid urine. He is throwing away his acid waste products, phosphates and the like, but conserving all his base to maintain a good state of hydration. As a result he has an acid urine even though he has profound alkalosis. Along with that, remember that the chloride in the urine may get you into serious trouble.

Urinary chloride has been used to follow the fluid balance of these individuals; but anyone who is in severe alkalosis and begins to develop some degree of renal impairment, spills chloride ion in the urine even though he is severely deficient. We may see serum chloride levels of half normal and find that the individual is putting out chloride ion in his urine. If you checked his urine you would say, "Well, this fellow is not in chloride deficit because he has chloride ion in his urine." But that does not hold when the patient has impairment to his kidneys or is severely dehydrated.

QUESTION: How is blood potassium determined?

ANSWER: We might say first that the best method now is the flame photometer.

QUESTION: Is the procedure within the facilities of the ordinary hospital laboratory?

ANSWER: I think we can say yes. A flame photometer is now on the market that costs several hundred dollars, not the $1,000 or $1,800 that some of them have cost in the past. Most of the laboratories can pay for the machine fairly soon. It is a test that takes about fifteen minutes once you are set up to do it. If there is a test being run only once in a long while, it is a difficult procedure; but if you are in a location where several are being done, it is fairly simple to do.

You may follow this by means of the electrocardiograph; and if you can interpret the electrocardiograph and the changes in the T waves, you can follow these levels quite well without the use of the flame photometer.

Along with that, we like to point out that if you think you have deficiency of potassium and the patient has respiratory paralysis, you must treat that situation immediately and not wait for twenty-four hours to get back the results of the potassium test. You may have a dead patient on your hands if you do. I recall one patient whom we examined in the city not too long ago. He was a diabetic who came out of a coma and was having some difficulty in breathing. Somebody saw that patient about five or six in the evening and recommended that he receive potassium. It was a little difficult to get; they looked around and could not find it. They did withdraw blood that night to have the potassium test made the next day. About four or five that morning the patient died. He had a potassium level of about half normal value. You cannot wait when the patient begins to develop respiratory paralysis; he may die. If you are in that situation, you are forced to treat the patient even though you do not have the procedure available to determine the potassium level.

QUESTION: In hospitals where potassium levels are not available, is one justified, after three or four days of nasogastric suction, in using potassium at that time?

ANSWER: I think we can reply yes to that question and I judge we can go a little bit further at the present time and recommend that prophylaxis begin immediately after surgery, in the neighborhood of 2 to 6 gm. of potassium chloride per day. This may be added to any intravenous solution, putting 2 gm. of potassium in 1 L. once or twice or maybe three times a day, and I think we can stay out of trouble in almost every instance.

QUESTION: Do you have any suggestions for

the psychologic preparation of patients who are about to undergo surgery?

ANSWER BY DR. GEORGE HARDING (Los Angeles, Calif.): I shall relate an observation of my intern days. Dr. James F. Baldwin, who was the chief surgeon, and still operating although in his early eighties at the time, never failed to go to the patient's room before major surgery. He also took a little time to drop into the anesthetic room and, if possible, felt the patient's pulse. I could not see at the time why it was so important, but he always observed, no matter how poorly the patient was, "strong, fine pulse." I used to wonder whether he could feel the pulse or not because sometimes I could not get it at all. Not only the patient but also the relatives knew that this doctor was interested in the outcome of that operation.

I think, therefore, that the psychologic preparation of the patient should include this personal interest and personal touch, because there is something significant in the physical contact with the patient. Even if one does not count the pulse, it might be worth while to "feel the pulse."

QUESTION: Is bleeding, either visible or occult, ever caused by the irritable colon?

ANSWER: You are in a much better position to judge that than I. I am dependent upon the reports of Wolf and Wolfe in the ulcerative colitis patient, but I think that the mucosa of the irritable colon becomes engorged in the same way as those of some patients with ulcerative colitis.

Just briefly, I have a relative whom I have observed over a period of fifteen years. We knew that she had diverticulosis, but she had recurrent hemorrhages following such emotional experiences as the wedding of her granddaughter and the time when her son was thought to be missing in action. Any severe emotional stress might produce hemorrhage, requiring transfusion on at least a dozen occasions. Finally, at colectomy there proved to be a hemangioma of the cecum.

The fact that she had an organic lesion did not remove the fact that under emotional stress there was a physiologic change in the colon and in the cecum in this instance, which caused massive hemorrhages which disappeared, of course, after colectomy.

QUESTION: Please make a recommendation for handling a patient with chronic ulcerative colitis who is in need of psychiatric therapy.

ANSWER: Dr. Buie answered the question very well, I think, but I would like to add the following observations. A young woman whom I first saw some twenty years ago had this experience: Every time she had company she had diarrhea, and her husband thought that it must be a nervous reaction becaused it occurred only when they had company. I followed her case for a number of years and while I did not learn all of her background for approximately five years or more, an understanding of it has had a favorable effect on the long-term therapy of the patient.

When she was eleven years of age, her mother, who had a rheumatic heart, said to her, "Esther, I want you to wash the dishes." Instead she went to the kitchen and out the back door to play. When she returned her grandmother was at the door. "I told you so, Esther, I told you you would do it. You never would mind your mother, would you, and now you've killed her." The mother, who had a bad heart, had gotten up and said, "Oh, don't call her back, let me wash the dishes," and dropped dead while doing them. The grandmother, unthinking and unfeeling as she was, let this little girl of eleven believe that she had killed her mother. She was passed from one member of the family to another over a period of years but never succeeded in finding a substitute mother. All had only resentment of the fact that they had to take this little orphan girl and raise her.

The only one who was kind and understanding was an uncle. Therefore, she became convinced that only men were understanding and she hated women, and does today, or almost does. She is not always popular in women's groups, but in a mixed group you will find four or five of the men around her all the time.

The most recent attack, at which time she gained her insight and understanding, occurred about the time her husband's mother came to live with them. Here, again, was a threat to her safety and security like her grandmother after her mother's death. Therefore, every time her mother-in-law came to vist them, Esther would develop diarrhea and symptoms of an irritable bowel and had to go to bed.

As she gained an insight into the relationship and a number of others that came along, she was able to make herself more acceptable to other women, to realize that if she considered women unfriendly and a threat to her emotional safety and security she would have these attacks. She deliberately tried to be less critical.

She came to accept the fact that she would always be more comfortable in the presence of men.

Another important point: When her little girl reached the age of eleven and began to contradict her mother, she became so resentful that she could have slapped the child, although she had been very considerate of her son who was two years older. Her husband, who had become interested in this matter, said, "Now look, Esther, you could stand Tommy and all of his difficulties. You must accept this little girl because you are taking an attitude toward her as you did toward that inconsiderate grandmother of yours."

I have seen Esther within the last month and she told me that one of the greatest satisfactions to her is that because of that understanding she has now made herself the friend and companion of her daughter and has deliberately taken up work as a Girl Scout leader in order to have a more understanding attitute toward her own daughter and her sex.

As you might expect, her gastrointestinal symptoms have largely disappeared. She knows the origin of her complaint and can laugh about it. Any symptomatic difficulty is relieved by a little paregoric.

QUESTION: What percentage of adenomatous polyps with malignant degeneration in the distal portion, with the stalk free of invasion, will show metastasis to regional glands?

ANSWER BY DR. ROBERT SCARBOROUGH (San Francisco, Calif.): I can not answer the first question. I do know that of the first nine polyps of the sigmoid which I removed, that appeared grossly benign and in which there was malignant degeneration in that portion of the periphery of the polyp and no involvement of the stalk, three of them had regional node metastases. That personal experience at the beginning has made me leery of possible metastases in any polyp that has malignancy whether or not the stalk is involved.

I am sure that in our later experience the percentage was not as high, but I am not certain of how high it was. I certainly am a minority in the opinion about possible gland metastases when the pedicle of a polyp is not involved, but as the years go by we see, I believe, an additional case or two a year in which that occurs. Just to impress it upon you, you might look at two pictures in an exhibit in the Galeria which show such polyps and the nodes involved.

QUESTION: What do you consider the preferred procedure in the case of a large villous sessile papilloma of the rectum, inaccessible from below and benign on biopsy?

ANSWER: The qualification here is "inaccessible from below." We will accept that for one reason or another, and we will assume that this must therefore be approached through the abdomen.

The villous tumor or papillary adenoma is one of the most treacherous tumors with which we have to deal. They may attain tremendous size and remain benign, but in a fairly high percentage of these tumors there are small areas of malignant degeneration, usually deep in the base; and when such malignant degeneration occurs, they are just as treacherous as any other type of carcinoma. Therefore, this particular tumor described must be entirely removed. Approach through the abdomen may permit a colotomy incision low down in the rectum, and removal of a relatively small tumor on a freely movable mucosa, and then closure of the bowel wall.

However, my interpretation of this would be that it is a tumor of such size that local excision is impracticable, even through the abdomen. In such a case I think we have the ideal condition in which resection and low pelvic anastomosis is the procedure of choice, and in such tumors I think it is far better to remove the segment of bowel, including the entire tumor, than to try local excision or repeated fulguration, because they tend to recede and recur and eventually the possibility of malignancy is high.

QUESTION: What is the most effective method of dealing with greatly delayed healing of anorectal postoperative wounds?

ANSWER: We could probably write an entire chapter on that, and yet, I really do not know a simple answer. I think that in every case of a surgical procedure in which there is unusual delay in wound healing we should, for our own edification, carefully review the surgical procedure that we have employed and try honestly to evaluate it as to whether or not it was proper and adequate in the first place, with adequate distal drainage of the wound, that would permit proper healing.

Certainly, the postoperative care of anal wounds is as important as the proper surgical procedure. Whether you see those patients every day, every other day or twice a week depends on you, but you should see them

sufficiently often to be sure that the wound has at all times proper external drainage so that healing can occur from within out.

There are instances in which there appears to be a perfectly properly devised wound; it appears to have perfectly firm, healthy granulation tissue, with adequate external drainage, in which for some reason there is definite delay in healing which I believe must be due to some symbiotic action of bacteria. I do not know anything more than that about it, and I hope that somebody can help us to find the cause and tell us what the treatment is.

I have here a clipping from this morning's *Los Angeles Examiner* which I hoped I might use to handle all of my questions today. I thought it would be much simpler than trying to take them up individually and I think, perhaps just to relieve the serious tension of this meeting today, before we go back to further scientific papers in a few minutes, we might consider this as the answer to some of these questions. If it were only true, it would be wonderful. This is an advertisement for oil colonics.

In big letters, it says, "These are much better. When others fail, we get results. Reasonable cost, lasting results. All cases of toxins, poisons, are successfully treated by our method of colonic therapy. No after-constipation, as in other methods. Chronic constipation, dropped bowel and stomach, spastic colon, colitis, back ache, arthritis, sinus, liver, mucous colitis—lasting results. Oil colonics."

QUESTION: Please discuss the treatment of acute anal lesions in the presence of existing leukemia.

ANSWER BY DR. GEORGE E. BINKLEY (New York, N. Y.): Fortunately, I see very few acute lesions in patients with leukemia although Dr. Craver has many leukemic patients at Memorial Hospital. Occasionally one encounters an abscess or a thrombotic hemorrhoid. I can recall one patient whom I saw many years ago with a polypoid lesion that was diagnosed as lymphosarcoma.

QUESTION: What is your present opinion of the efficacy of irradiation in malignant tumors of the rectum and colon?

ANSWER: Twenty-five years ago radiation therapy was the treatment of choice in a high percentage of large bowel cancers because of the high operative mortality (20 to 40 per cent) that followed radical surgery at that time. Radiation therapy of cancer of the rectum is rapidly becoming a lost art but it should be given greater consideration.

The average surgeon is not trained in the use of the physical agents. Therefore, he prefers to rely upon surgery for eradication or palliation. One might summarize by stating that a number of very early low grade cancers of the rectum may be eradicated by x-ray and radium in the hands of those well trained in the technic of application. X-ray therapy still has a field of usefulness in advanced operable and recurrent stages of disease. X-ray therapy is also of value when administered to the advanced operable case a couple of weeks prior to operation. The degree of infection is lessened and the operation is often rendered much less difficult.

QUESTION: What in your opinion are the relative merits of the low anterior resection as compared to the so-called pull-through operation?

ANSWER: This is a big question as it covers the subject of treatment of rectal cancer. A number of surgeons who devise or advocate certain technics seem to forget that cancer has not changed during the years. The disease spreads in the same fashion today as it did many years ago. The only operation that will cure the patient is the one that removes all the cancer cells. Sufficient time has not elapsed for me to evaluate the anterior resection. The results to date on lesions at the rectosigmoid junction have been better than I anticipated when we began doing this type of operation.

It is difficult to discuss low resections because of the marked variation in opinion as to what constitutes low and high. When the lesion is situated near the anus, the dissection must be very radical in order to remove all the lymphatic-drained tissue. With our present technic I do not believe that one can remove adequately the lymphatic-drained areas of low rectal cancer with either the anterior resection or the pull-through operation. I believe that the majority of these cases are best treated with extensive abdominoperineal resections. I do not believe that the pull-through operation is as radical as a wide segmental resection. Of course, the result will depend upon the surgeon's technic. We are doing a number of low resections but I cannot evaluate this method at this time. We reserve the pull-through procedure for large non-malignant lesions as we do not consider this type of resection sufficiently radical to be termed a cancer operation.

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AWARDS

The Hermance Plaque. In 1940, Dr. W. Oakley Hermance of Philadelphia, a past-president of our Society (1931–1932), established an annual award for the best scientific paper submitted by an Associate Fellow or Affiliate member of The American Proctologic Society. In 1950 this plaque was awarded to Dr. Mark M. Marks for his paper, "Barium Modification with Methocel."

The A. B. Graham Award. The A. B. Graham Award is given in recognition of the best paper or report of investigative work on the subject of non-malignant ulcerative diseases of the colon and rectum. It was established by Doctors Joseph W. Ricketts and Emor L. Cartwright in honor of Dr. Alois B. Graham who was president of our Society in 1921–22. Any member of our Society is eligible for this award. In 1950 it was given to Dr. Robert J. Rowe for his paper, "Evaluation of Chloromycetin as an Adjunct to the Surgical Therapy of Lymphogranuloma Venereum and Segmental Ulcerative Colitis."

The Cincinnati Proctologic Society Award. On even years the Cincinnati Proctologic Society will make an award to an Affiliate member for the best paper on a proctologic subject. The group has offered this award as a means of stimulating even greater scientific interest among the Affiliate members of the Society. Dr. William A. Blank won this award for 1950. His paper was entitled "Cytologic Diagnosis of Lesions in the Sigmoid Colon and Rectum."

* * *

The Fiftieth Annual Meeting of The American Proctologic Society will be held at the Marlborough-Blenheim Hotel, Atlantic City, New Jersey, June 7, 8 and 9, 1951. Registration takes place on Wednesday afternoon, June 6th, and can be made by guest card only. These guest cards can be obtained through the Secretary at the request of a member of the Society.

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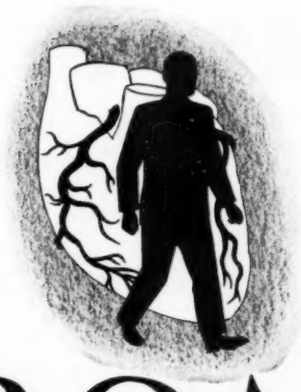

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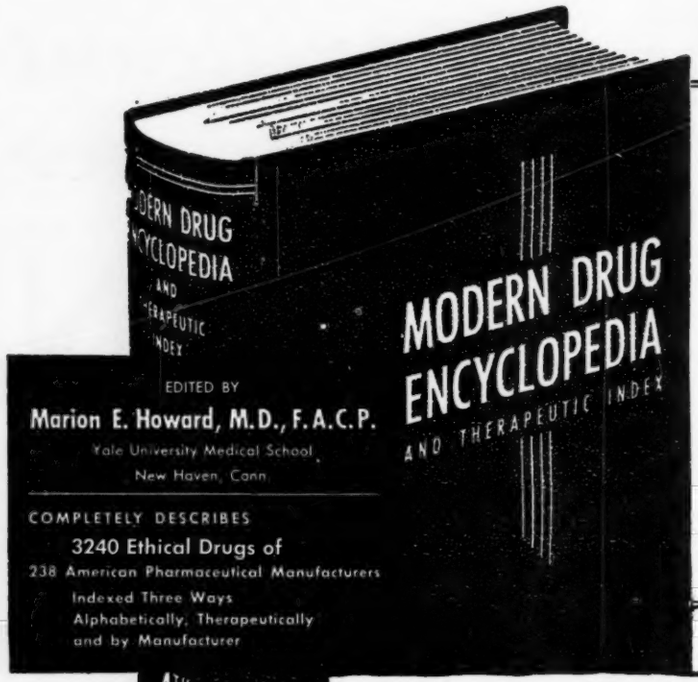

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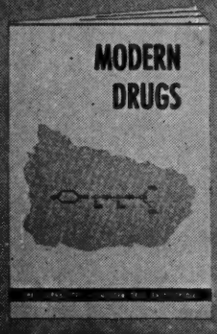

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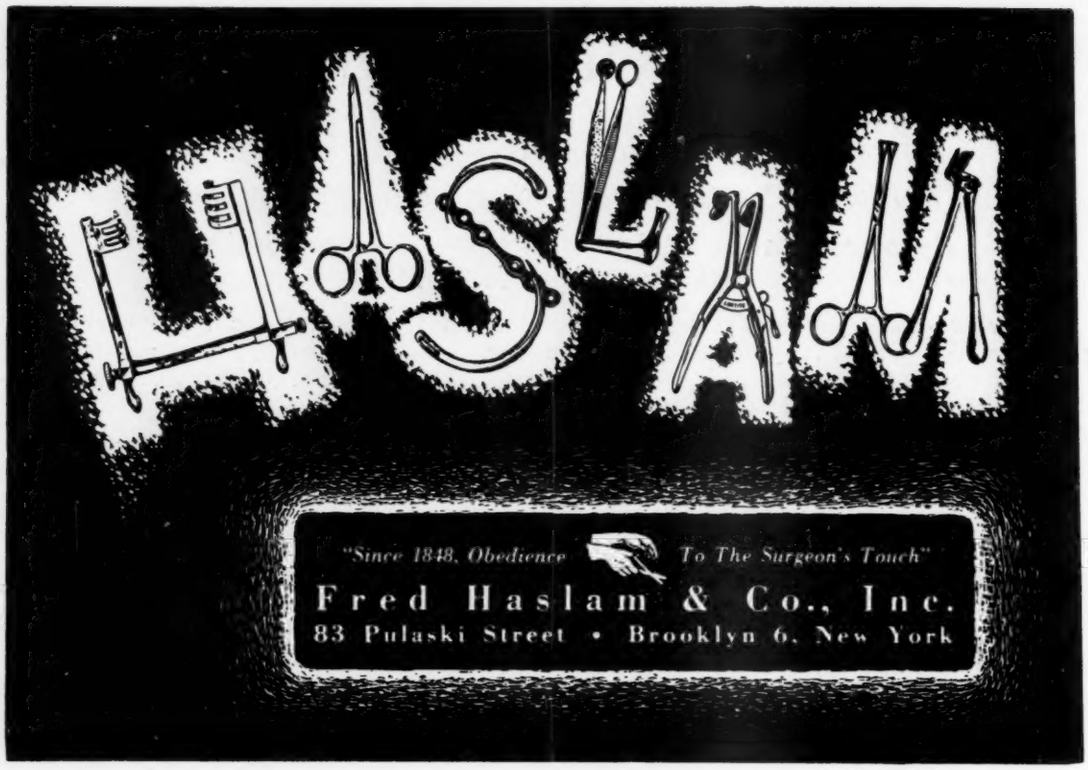

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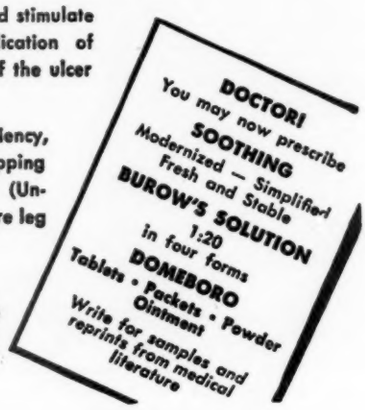

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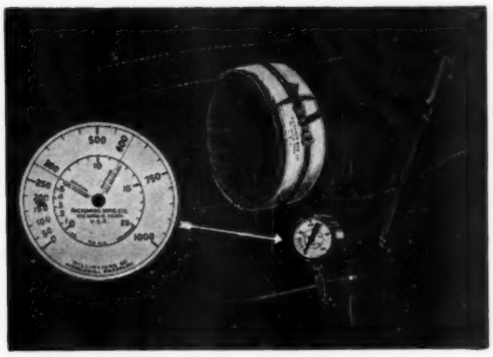

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(*continued from page 28*)

City in May. Dr. Fred H. Falls, head of the Department of Obstetrics and Gynecology at the University of Illinois and treasurer of the American Committee on Maternal Welfare for the past several years, will serve as general chairman of the Fifth American Congress. Dr. Fred L. Adair, President of the American Committee since its incorporation in 1934, is planning to spend the greater part of his time in Florida. Other appointments will be announced as they are made. Dr. George W. Kosmak, New York City, chairman of the Publications Committee, is now editing the Proceedings of the International and Fourth American Congress on Obstetrics and Gynecology held in New York City in May.

THE Department of Defense recently asked the Selective Service System to induct a total of 922 medical doctors, 500 dentists and 100 veterinarians in November, December and January for assignment to the Department of the Army. The Department of the Navy and the Department of the Air Force have indicated that present plans do not call for submission of requisitions in these categories.

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THE significance of two little known diseases in the underwriting of life insurance was discussed at the fifty-ninth annual meeting of the Association of Life Insurance Medical Directors by Dr. Hugh B. Campbell, medical consultant of the Phoenix Mutual Life Insurance Co., Hartford, Connecticut. One of the diseases, histoplasmosis, Dr. Campbell said is important only in that its residual effects may sometimes give the appearance that the patient has at one time suffered from tuberculosis. The disease is an infection caused by a type of yeast and has mainly appeared in the central Mississippi Valley in the United States and in adjacent areas.

"Histoplasmosis," Dr. Campbell said, "has created a considerable disturbance in the minds of those coming in contact with it because the residual pulmonary calcifications are similar to those seen in healed miliary tuberculosis. Present day information, however, is that healed calcifications due to this condition are without significance."

The second disease discussed by Dr. Campbell was sarcoidosis which he described as a general systemic disease which can affect any organ or system in the body and which at times in its pulmonary form simulates tuberculosis. Present information he said is that the longevity implications of sarcoidosis are very serious; the disease is unstable, no cure is known, it tends to run a prolonged course and not infrequently those suffering from it die of tuberculosis.

"WORLD medicine is one of the most potent universal mediums of promoting international good will and peace," Dr. Elwood A. Sharp, director of the Department of Clinical Investigation of Parke, Davis & Co., told medical scientists from thirty-eight countries at a dinner given to them by the company at Hotel Roosevelt (New York, N. Y.).

Greeting delegates, alternates, observers and their wives attending the fourth general assembly of The World Medical Association on behalf of Dr. A. W. Lescohier, President of Parke, Davis & Co., Dr. Sharp pointed out how world medicine knows no national boundaries in its efforts to cure and prevent the ills of mankind.

Austria and Bulgaria were the only nations represented that are close to the Soviet and its satellite countries.

"We in the Americas," continued Dr. Sharp, in an informal greeting to the 300 diners, "believe The World Medical Association, and the 38 national organizations of which it is composed, is a medium which will give us an opportunity to learn from our medical brethren in other countries much that we can use, and that we in turn will contribute to their medical science."

LIAQUAT Ali Khan, Prime Minister of Pakistan, is the author of "Pakistan, The Heart of Asia," which has been published by the Harvard University Press. His book sums up in brief compass the successful struggle of the Moslems to establish their own republic and emphasizes the devotion of the new nation to the ideals of democracy, free enterprise and peace. The book is based upon addresses delivered by the Prime Minister while in the United States and Canada during May and June, 1950.

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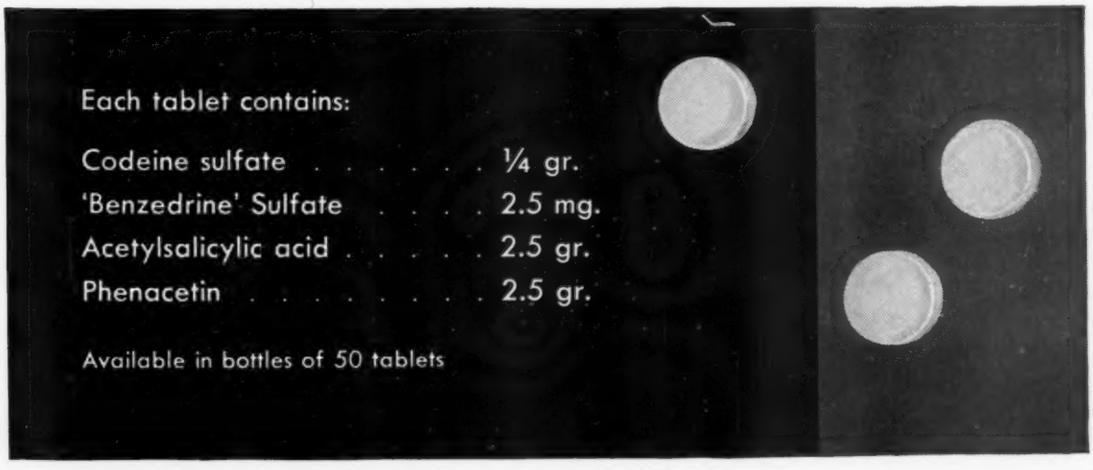
DOSAGE: One or two tablets repeated every three hours if necessary. Only in exceptional cases will more than six to eight tablets be required in a 24-hour period. If disturbance of sleep should be encountered in the higher dosage ranges, this can easily be controlled with a mild sedative.


Each tablet contains:
Codeine sulfate . . . . . ¼ gr.
'Benzedrine' Sulfate . . . . 2.5 mg.
Acetylsalicylic acid . . . . . 2.5 gr.
Phenacetin . . . . . 2.5 gr.
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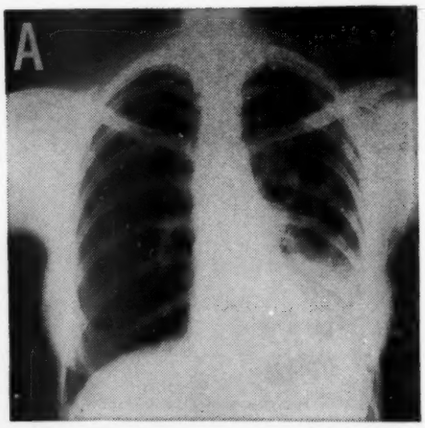
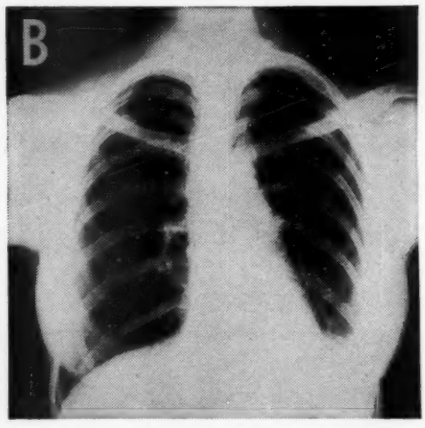
Para-aminosalicylic acid is capable of inhibiting or significantly delaying the emergence of bacterial resistance to dihydrostreptomycin or streptomycin.

These drugs are not to be regarded as substitutes for traditional therapeutic methods. Rather, they serve best when properly integrated with bed rest and, where necessary, collapse measures or other forms of surgery.





A. Before Treatment *(9 days prior to Dihydrostreptomycin therapy) Diffuse lobular tuberculous pneumonia, lower half of left lung; thin-walled cavity above hilus (3 x 3.5 cm.).*

B. After 3 Months' Treatment *(2 days after discontinuance of Dihydrostreptomycin) Considerable clearing of acute exudative process in the diseased lung; cavity smaller and wall thinner.*

Detailed literature on the subject of chemotherapy in tuberculosis will be supplied upon request.

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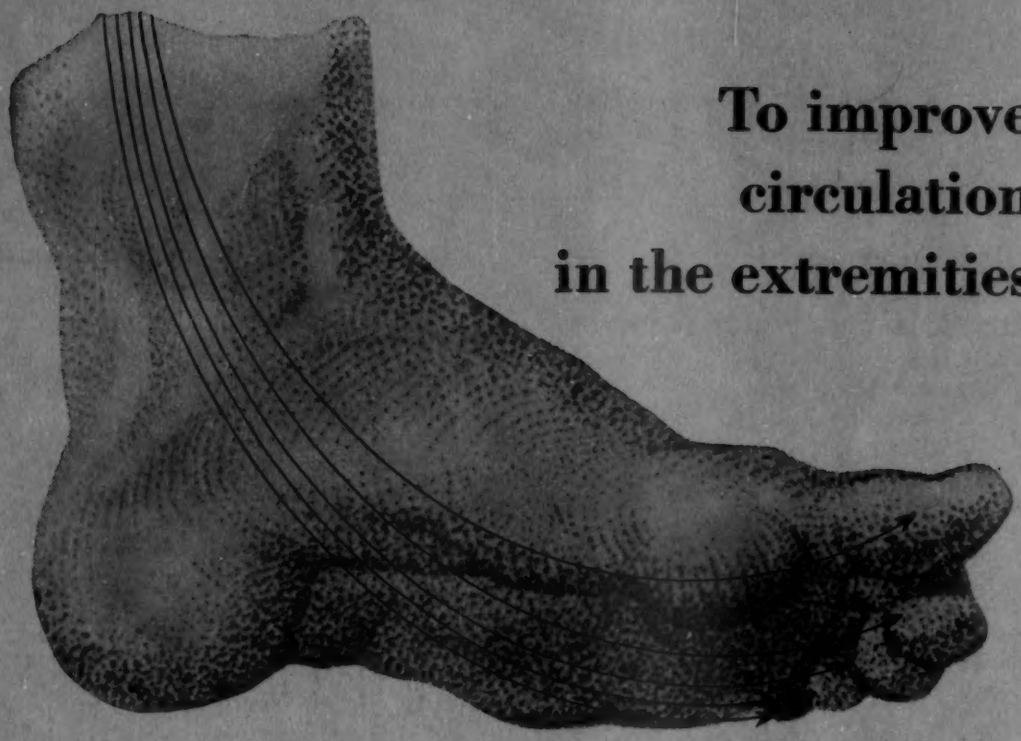

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